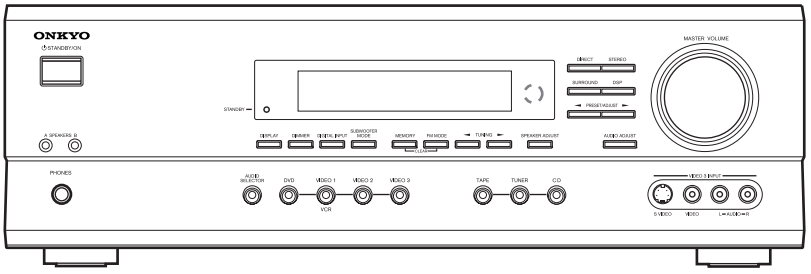
Ref. No. 3728
042002

# ONKYO SERVICE MANUAL

## AV RECEIVER
## MODEL HT-R500




### Black models

| | |
|---|---|
| **BMDD** | 120V AC, 60Hz |

### SAFETY-RELATED COMPONENT WARNING!!

**COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.**

**MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.**

ONKYO®
IMAGINATIVE SIGHT & SOUND

# SERVICE PROCEDURES

## 1. Replacing the fuses

This symbol located near the fuses indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating refer to the marking adjacent to the symbol.

Ce symbole indique que le fusible utlise est a rapide. Pour une protection permanente, n'untiliser que fusibles de meme type. Ce darnier est la qu le present symbol est appse.

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| F6901, F6902 | 252198 or 252261 | 8A-UL or 8A-T/UL-ST2,Fuse |
| F901 | 252198 or 252261 | 8A-UL or 8A-T/UL-ST2,Fuse |

## 2. To initialize the unit

This device employs a microprocessor to perform various functions and operations. If interference generated by an external power supply, radio wave, or other electrical source results in accident which causes the specified operations and functions to operate abnormally.
To perform a result, please follow the procedure below.

1.Press and hold down the VIDEO-1 button, then press the STANDBY/ON button.
2.After "clear" is displayed, the preset memory and each mode stored in the memory, such as surround, are initialized and will return to the factory setting.

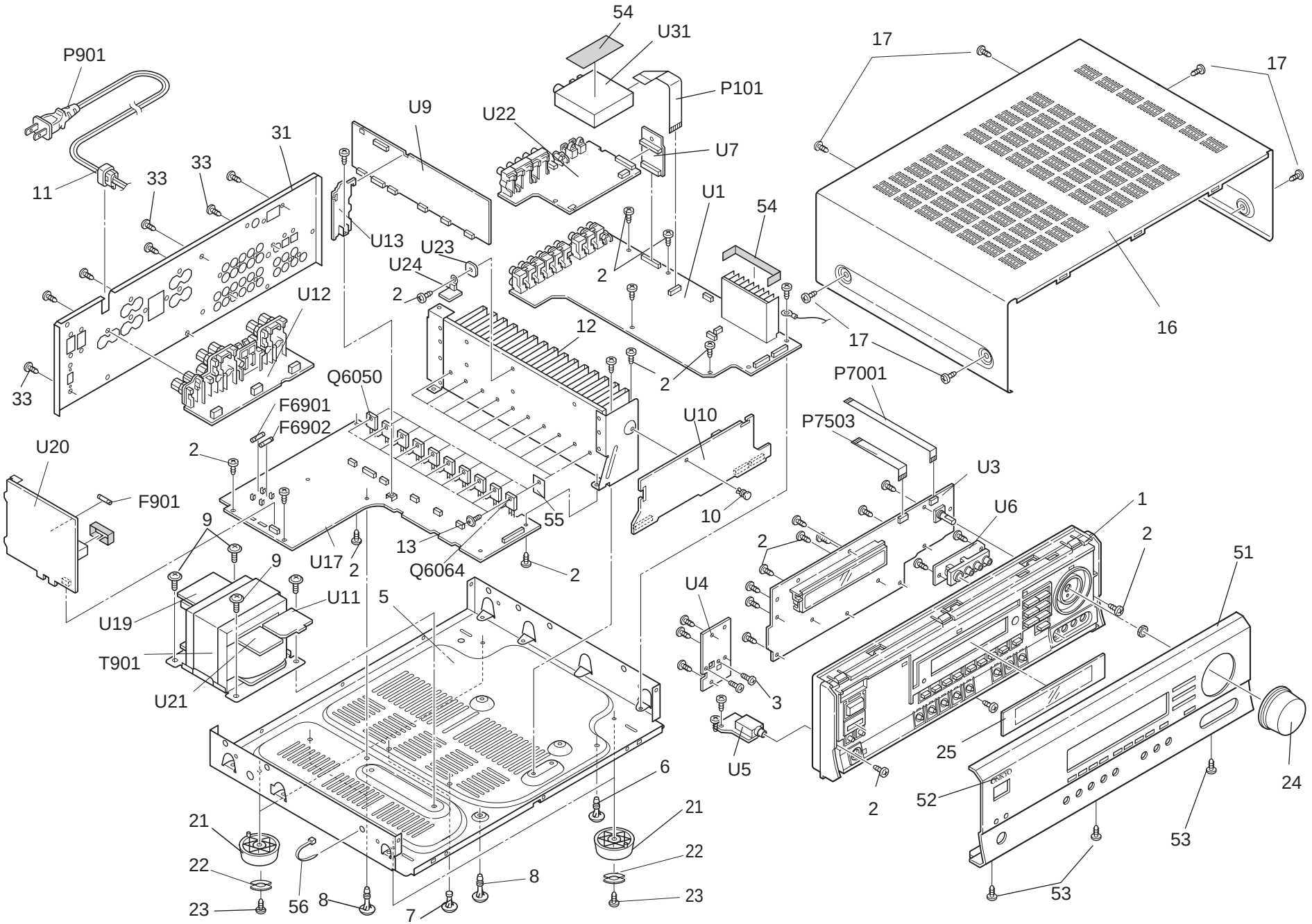
## 3. Safety-check out

(Only U.S.A. model)
After correcting the original service problem, perform the following safety check before releasing the set to the customer.
Connect the insulating-resistance tester between the plug of power supply cord and screw on the back panel.
Specifications: 3.3Mohm+/-10% at 500V.

## 4. Memory Preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves the contents of the memory during power failures and even when the unit is unplugged.The unit must be plugged in order to charge the back-up system.
The memory preservation period after the unit has been unplugged varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of a few weeks after the last time the unit has been unplugged.This period is shorter when the unit is exposed to a highly humid climate.

## EXPLODED VIEW



# EXPLODED VIEW

## PARTS LIST

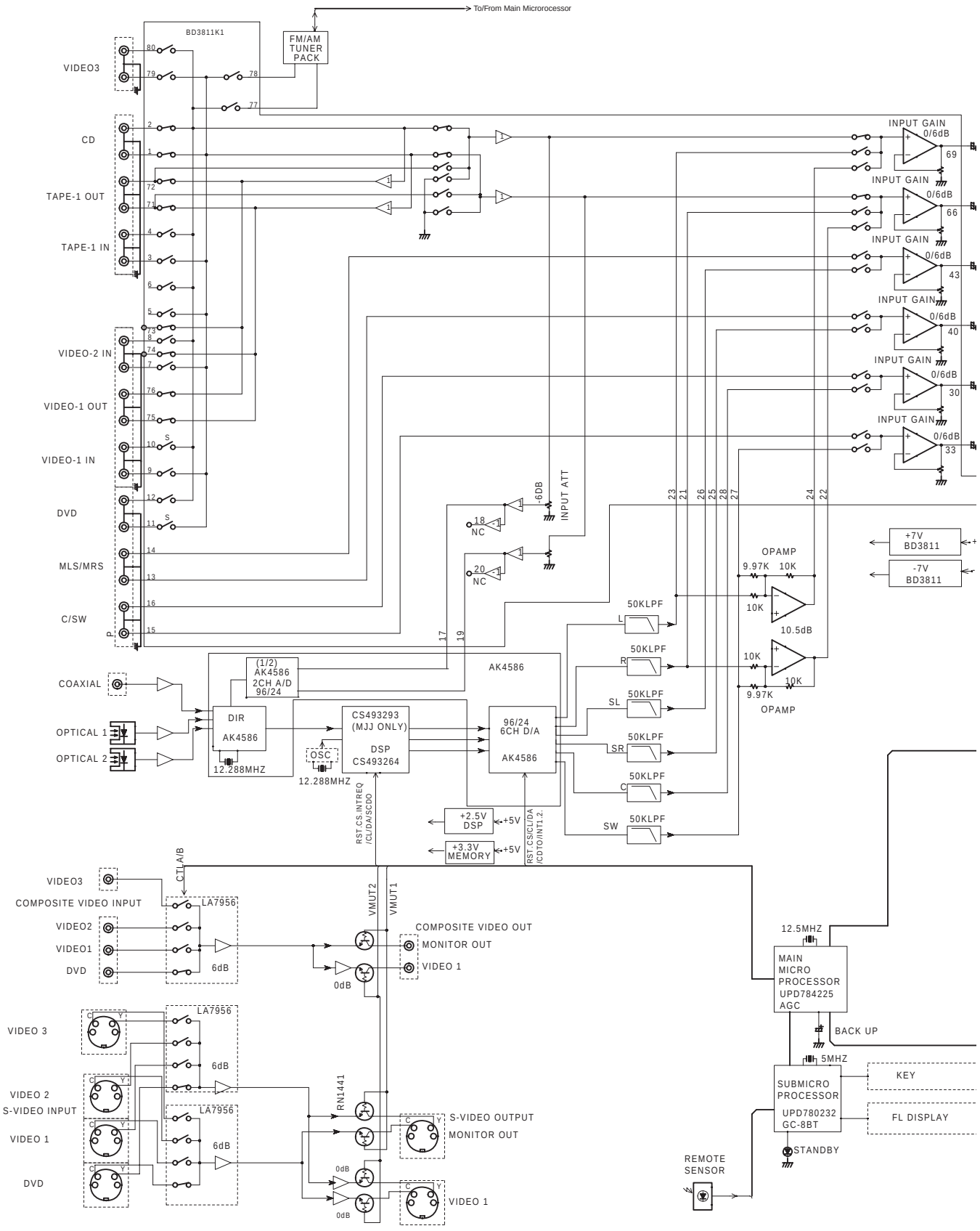
CAUTION: Replacement for transistor of mark *, if necessary must be made from the same beta group (**hFE**) as the original type.

| REF.NO. | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | 27111268 | Front bracket |
| 2 | 838130088 | 3TTB+8B,Self-tapping screw |
| 5 | 27100416 | Chassis |
| 6 | 27190503A | KGLS-8RF,Holder |
| 7 | 27190813 | KGPS-10RF,Holder |
| 8 | 27190428A | KGLS-10RF,Holder |
| 9 | 830440089 | 4TTC+8C(BC),Self-tapping screw |
| 10 | 880009 | NRP-345,Plastic rivet |
| 11 | 27300750 | ⚠ Bushing,cord |
| 12 | 27160511 | Heat sink |
| 13 | 801433 | 3SMS8W.SW+14B(BC),Special screw |
| 16 | 28184831 | Top cover |
| 17 | 838430088 | 3TTB+8B(BC),Self-tapping screw |
| 21 | 27175319B | Leg |
| 22 | 28141494 | Cushion |
| 23 | 838130088 | 3TTB+8B,Self-tapping screw |
| 24 | 28325641 | Knob, volume |
| 25 | 28191957 | Clear plate |
| 31 | 27122989A | Rear panel |
| 33 | 838430088 | 3TTB+8B(BC),Self-tapping screw |
| 51 | 27212402 | Front panel |
| 52 | 28135244 | Badge |
| 53 | 838430088 | 3TTB+8B(BC),Self-tapping screw |
| 54 | 29110083 | Tape cloth |
| 55 | 223024 | AC238,Isolated plate |
| 56 | 260208 | Wire tie |
| F6901, | 252198 or | ⚠ 8A-UL or |
| F6902 | 252261 | ⚠ 8A-T/UL-ST2,Fuse |
| F901 | 252198 or | ⚠ 8A-UL or |
| | 252261 | ⚠ 8A-T/UL-ST2,Fuse |
| P101 | 2047151512 | NCFC7-151512,Flexible flat cable |
| P7001 | 2045102012 | NCFC5-102012,Flexible flat cable |
| P7503 | 2047081012 | NCFC7-081012,Flexible flat cable |

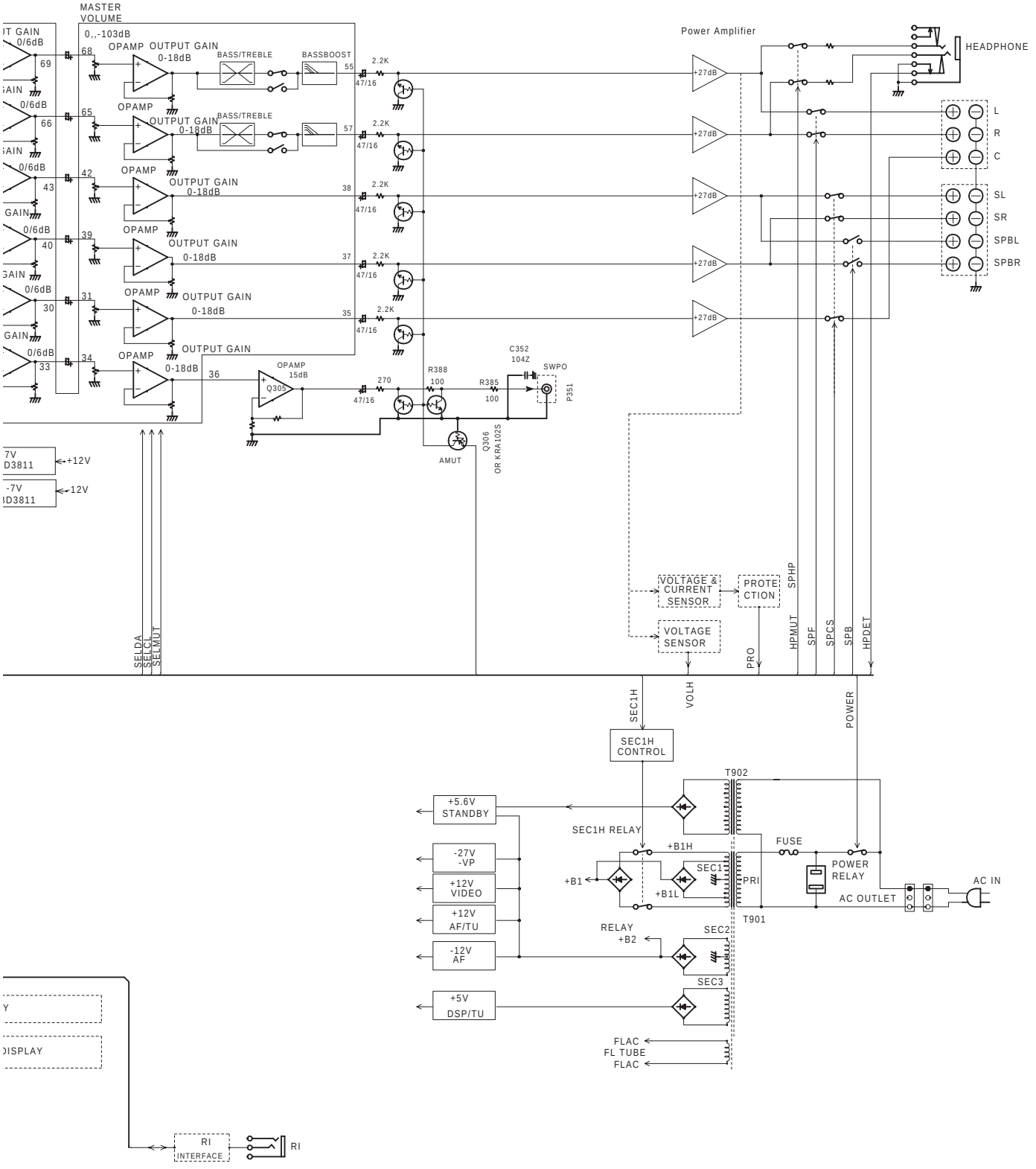
NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

| REF.NO. | PART NO. | DESCRIPTION |
|---|---|---|
| P901 | 253332HIT or | ⚠ AS-UC-2 or |
| | 253333VOL | ⚠ AS-UC-2,Power supply cord |
| Q6050~ | 2203563, | * KTC5242-O, |
| Q6054 | 2202842, | * 2SC5242-R, |
| | 2202843, | * 2SC5242-O, |
| | 2203562, | * KTC5242-R, |
| | 2203663, | * MN130S-O, |
| | 2203664 or | * MN130S-Y or |
| | 2203666 | * MN130S-P,Transistor |
| Q6060~ | 2203553, | * KTA1962-O, |
| Q6064 | 2202832, | * 2SA1962-R, |
| | 2202833, | * 2SA1962-O, |
| | 2203552, | * KTA1962-R, |
| | 2203673, | * MP130S-O, |
| | 2203674 or | * MP130S-Y or |
| | 2203676 | * MP130S-P,Transistor |
| T901 | 2301624 | ⚠ NPT-1446D,Power transformer |
| U1 | 1A928501-1F | NADG-7401-1F,DSP circuit PC board ass'y |
| U3 | 1A928503-1A | NADIS-7403-1A,Display circuit PC board ass'y |
| U4 | 1A928504-1A | NASW-7404-1A,Standby switch PC board ass'y |
| U5 | 1A928505-1A | NAETC-7405-1A,Headphone terminal PC board ass'y |
| U6 | 1A928506-1A | NAETC-7406-1A,Front video PC board ass'y |
| U7 | 1A928507-1A | NAETC-7407-1A,Connector PC board ass'y |
| U9 | 1A928509-2A | NAAF-7409-2A, Power amplifier driver PC board ass'y |
| U10 | 1A928510-2A | NAETC-7410-2A,Regulator PC board ass'y |
| U11 | 1A928511-2A | NAETC-7411-2A,Secondary PC board ass'y |
| U12 | 1A928512-2A | NAETC-7412-2A,Speaker terminal PC board ass'y |
| U13 | 1A928513-2A | NAETC-7413-2A,PC board for holder |
| U17 | 1A928517-2A | NAAF-7417-2A,Power amplifier PC board ass'y |
| U19 | 1A928519-2A | NAPS-7419-2A,Terminal PC board ass'y |
| U20 | 1A928520-2A | NAPS-7420-2A,Primary circuit PC board ass'y |
| U21 | 1A928521-2A | NAPS-7421-2A,Terminal PC board ass'y |
| U22 | 1A928522-2A | NAVD-7422-2A,Video terminal PC board ass'y |
| U23 | 1A928523-2A | NAETC-7423-2A,PC board for holder |
| U24 | 1A928524-2A | NAETC-7424-2A,Thermal detector circuit PC board ass'y |
| U31 | 240138A or | ENG06501QR or |
| | 240134A | TFCE1U114B,Tuner unit |

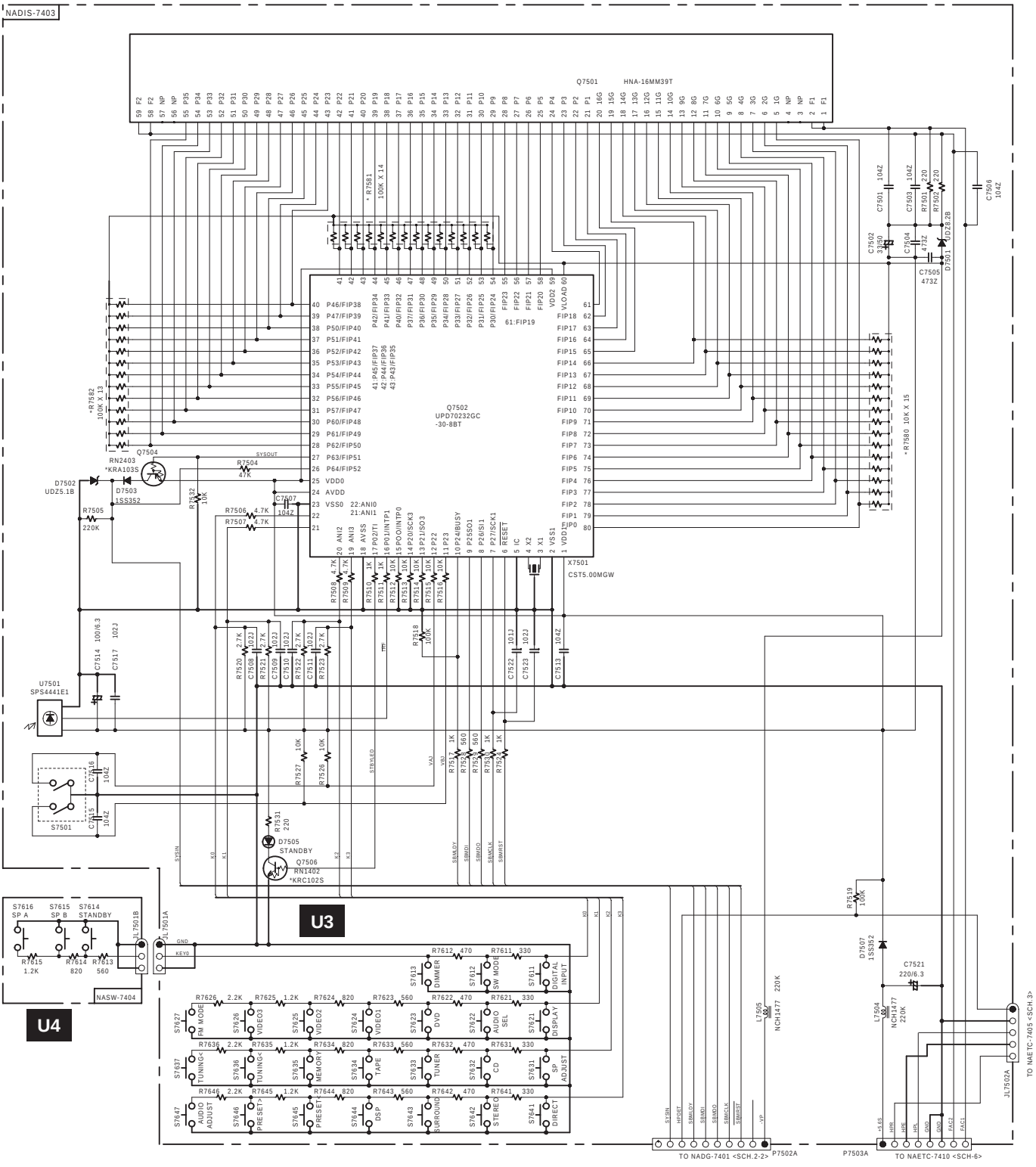
# BLOCK DIAGRAM 1



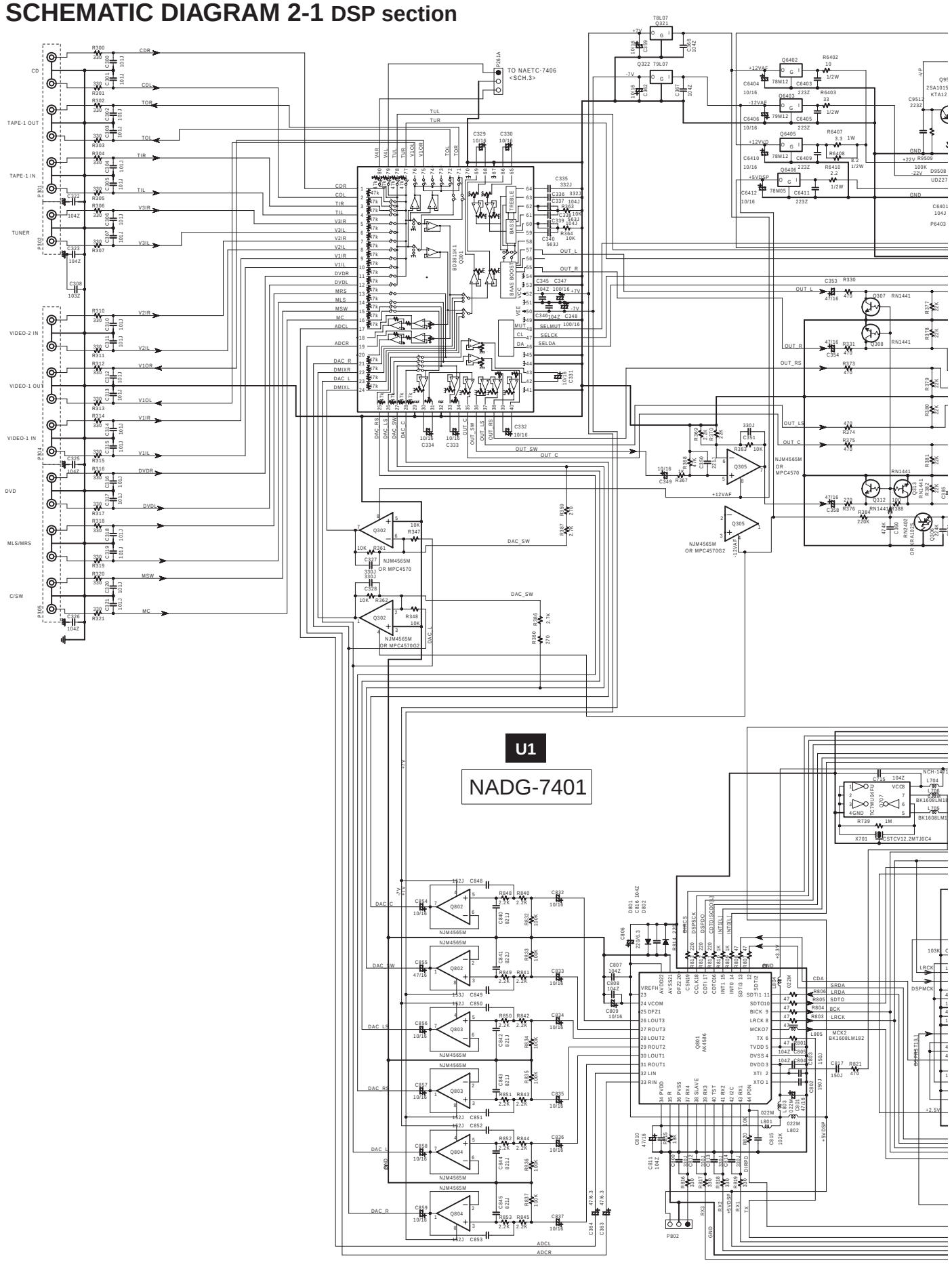
# BLOCK DIAGRAM 2



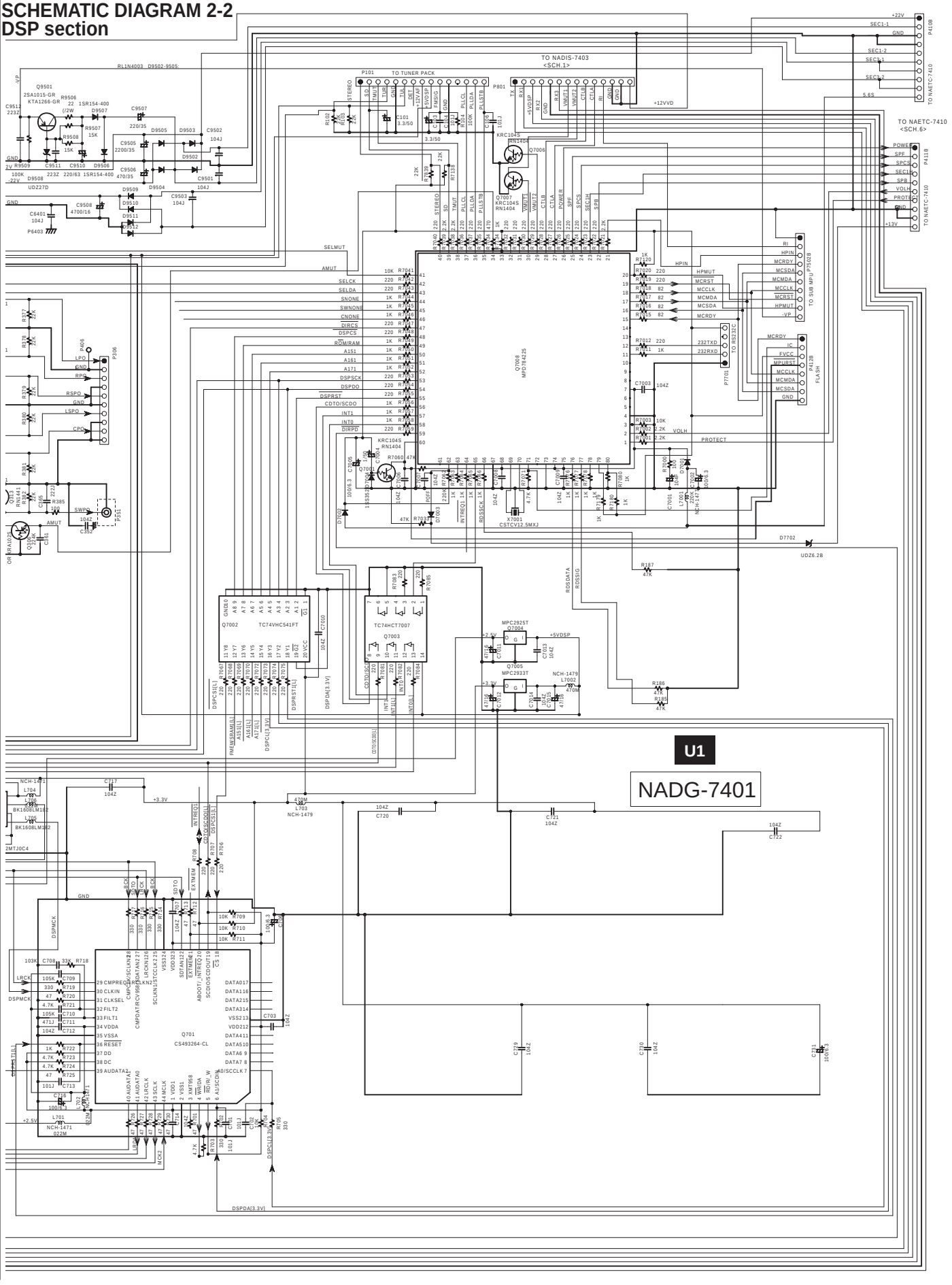
# SCHEMATIC DIAGRAM 1
## Display section



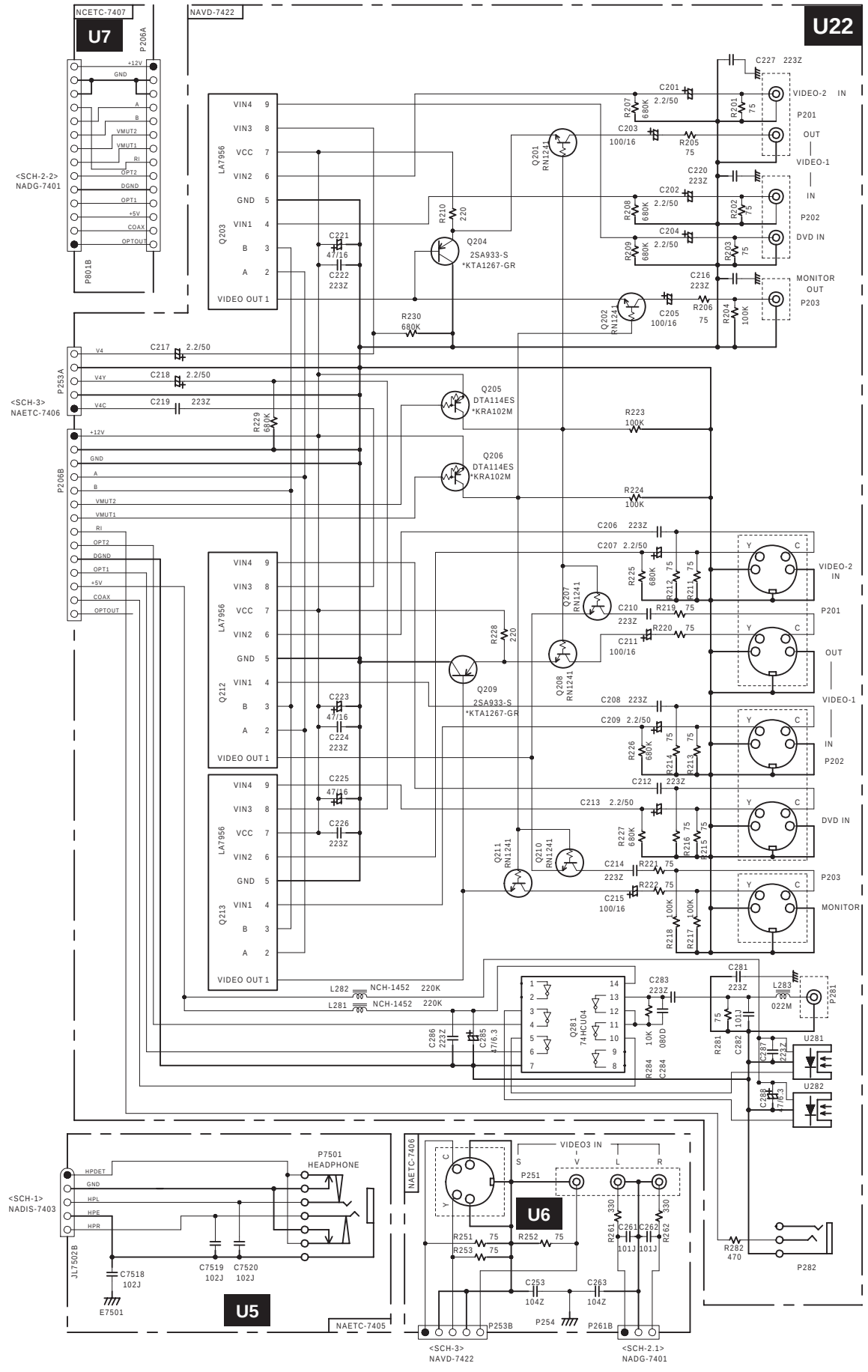
# SCHEMATIC DIAGRAM 2-1 DSP section



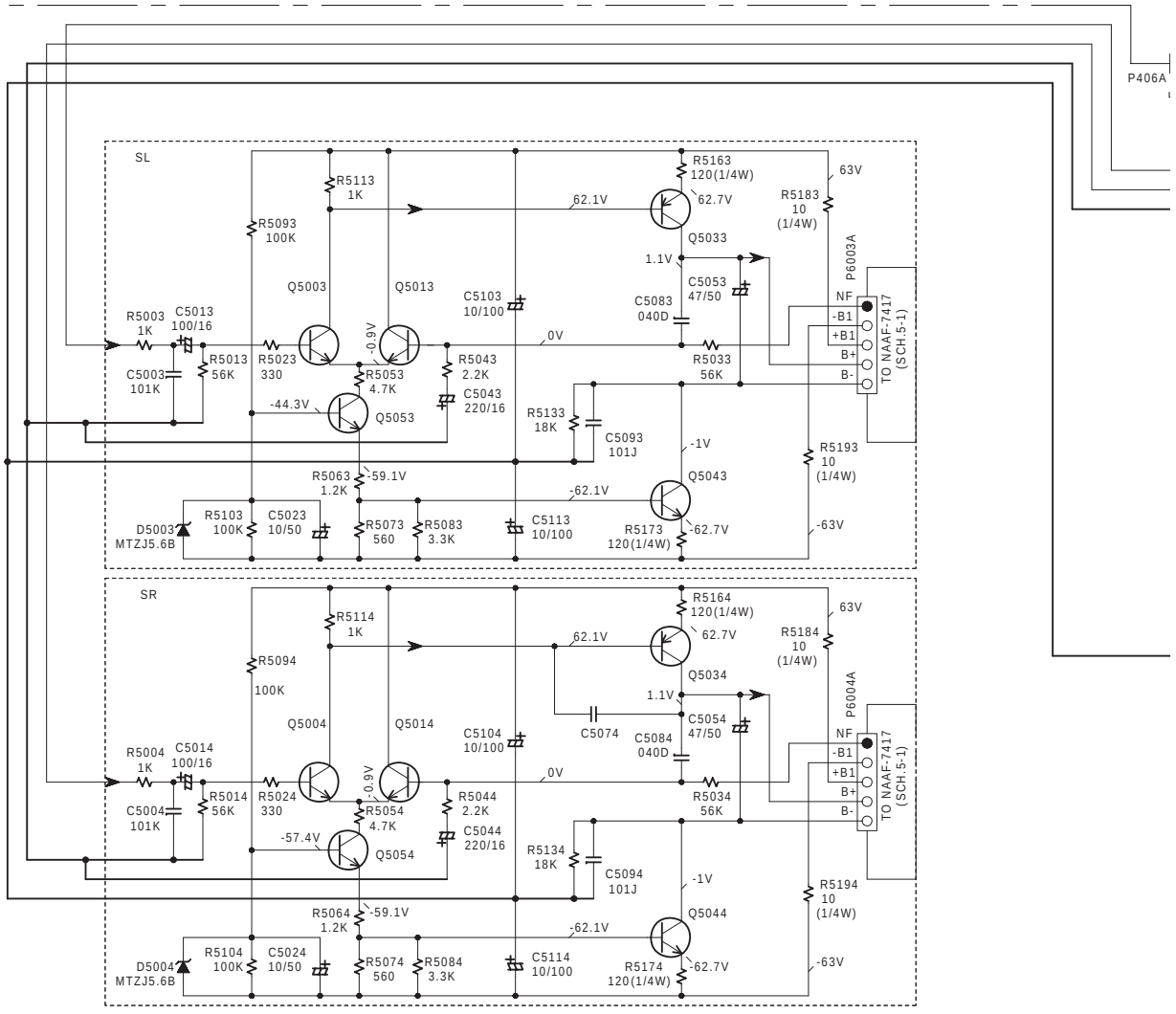
# SCHEMATIC DIAGRAM 2-2
## DSP section



# SCHEMATIC DIAGRAM 3 Video section



# SCHEMATIC DIAGRAM 4-1 Power amplifier section 1

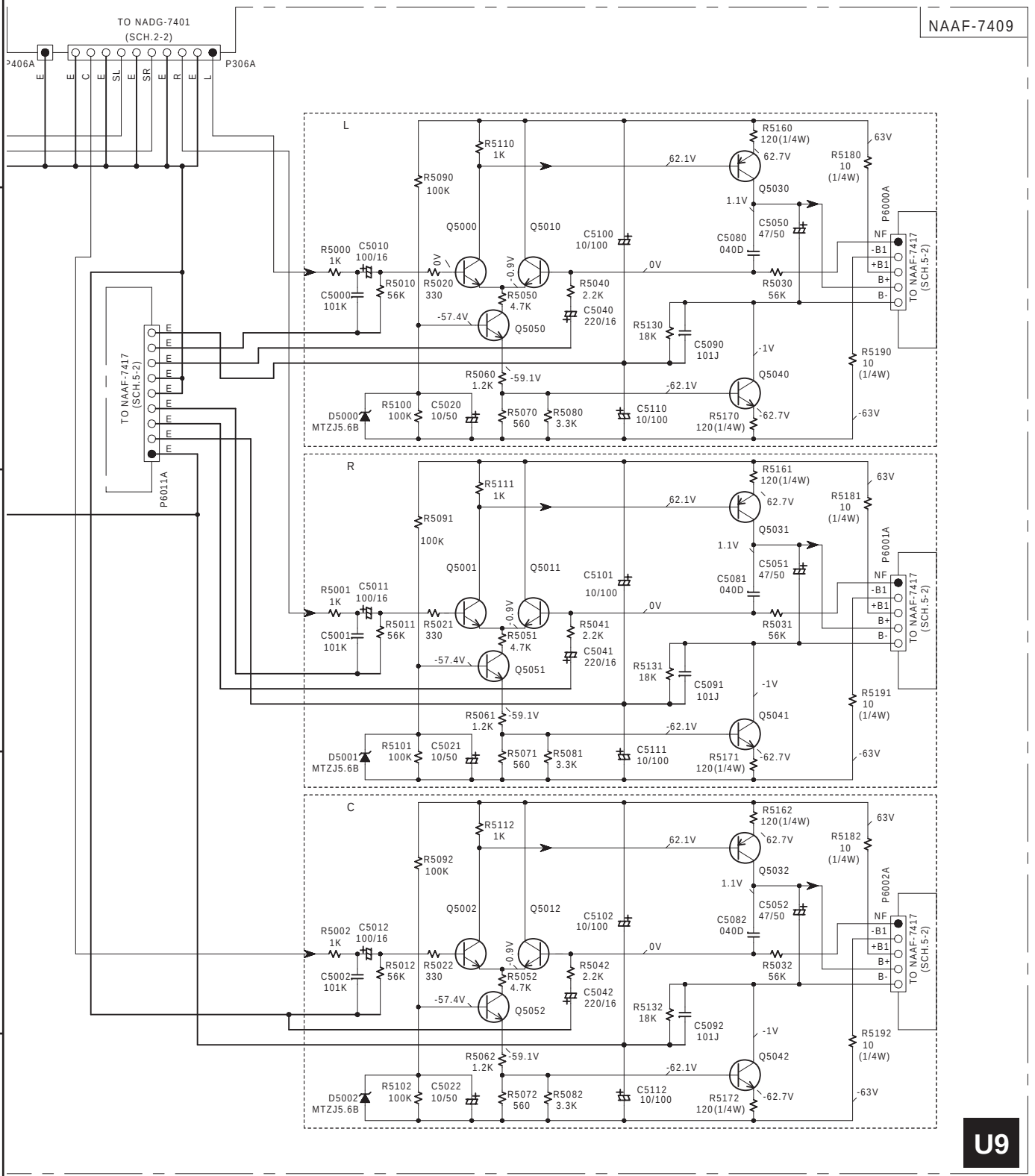



SEMICONDUCTORS

| NO. | |
|---|---|
| Q5000-04,5010-14 | KTC3200-BL OR 2SC1775A-E,F OR 2SC1845-E |
| Q5030-34 | KTA1024-Y,O OR 2SA949-Y,O |
| Q5040-44 | KTC3206-Y,O OR 2SC2229-Y,O |
| Q5050-54 | KTC3200-BL,GR OR 2SC1775A-E,F OR 2SC1845-E,F |

U9

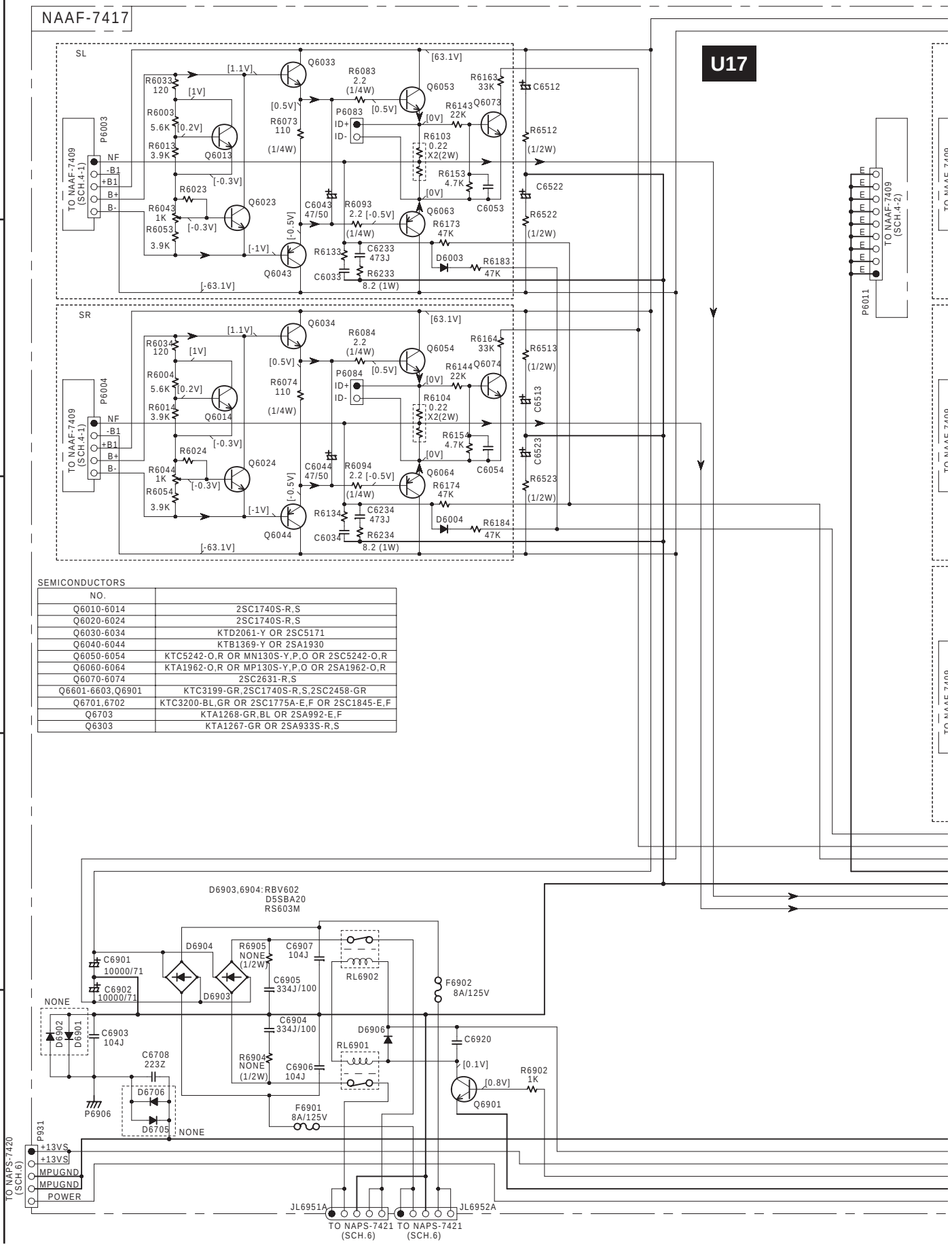
# SCHEMATIC DIAGRAM 4-2
## Power amplifier section 2



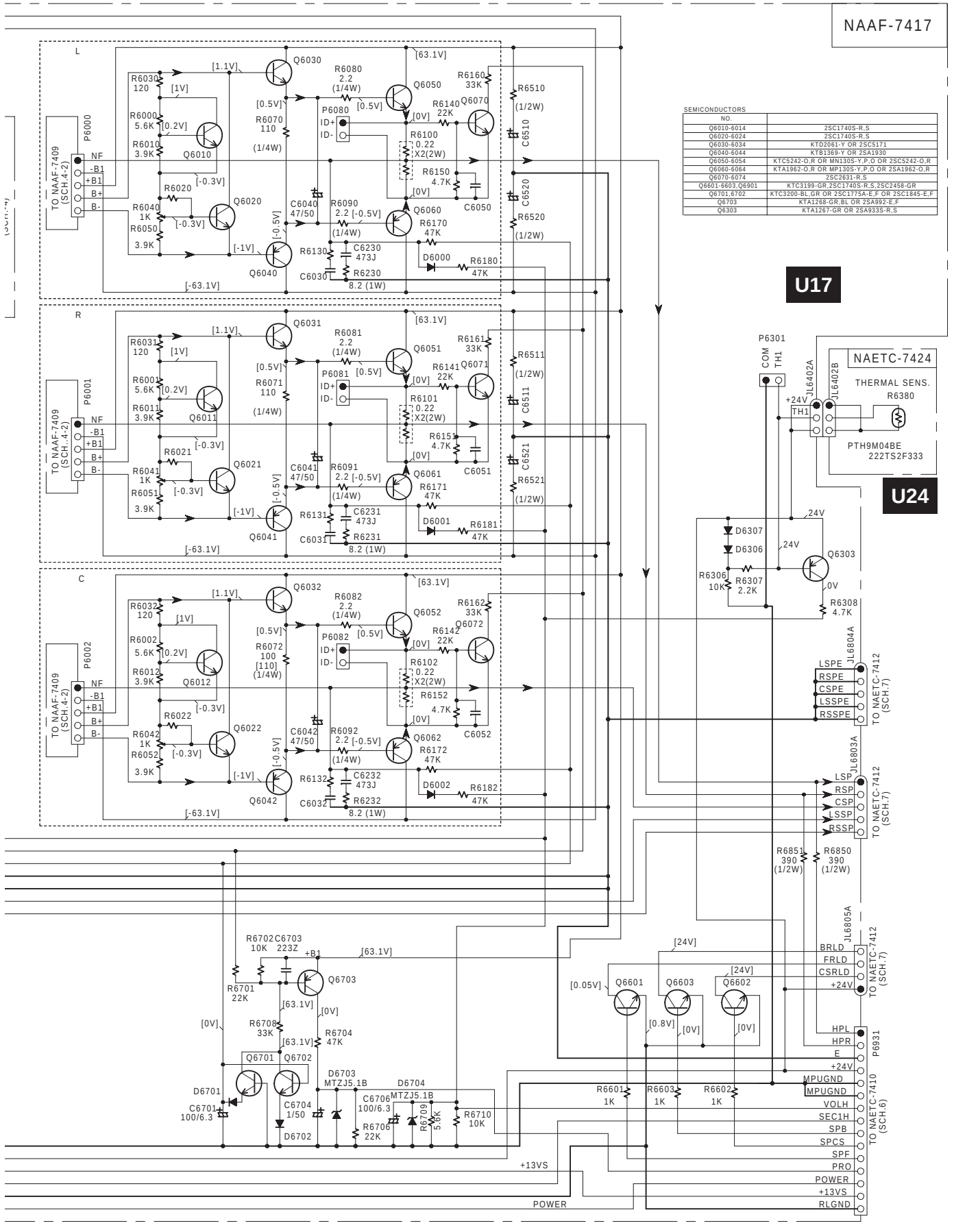

SEMICONDUCTORS

| NO. | |
|---|---|
| Q5000-04,5010-14 | KTC3200-BL OR 2SC1775A-E,F OR 2SC1845-E |
| Q5030-34 | KTA1024-Y,O OR 2SA949-Y,O |
| Q5040-44 | KTC3206-Y,O OR 2SC2229-Y,O |
| Q5050-54 | KTC3200-BL,GR OR 2SC1775A-E,F OR 2SC1845-E,F |

# SCHEMATIC DIAGRAM 5-1 Power amplifier section 3



# SCHEMATIC DIAGRAM 5-2 Power amplifier section 4



A B C D

1 2 3 4 5

# SCHEMATIC DIAGRAM 6
## Power supply section

NOTE

- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE(MEASURED WITH VOLTMETER) IS DC VOLTAGE. (NO INPUT SIGNAL)
- ELECTROLYTIC CAPACITORS ( ) ARE IN uF/WV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED.
  EX) 030→3pF 330→33pF 331→330pF 333→0.033uF
- ALL RESISTORS ARE IN OHMS 1/4WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES ON PC BOARD ARE THE PRINTING SIDE OF THE PARTS.
  EX) PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

THIS SYMBOL LOCATED NEAR THE FUSE INDICATES THAT THE FUSE USED IS SLOW OPERATING TYPE FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,REPLACE WITH SAME TYPE FUSE. FOR FUSE RATING REFER TO THE MARKING ADJACENT TO THE SYMBOL

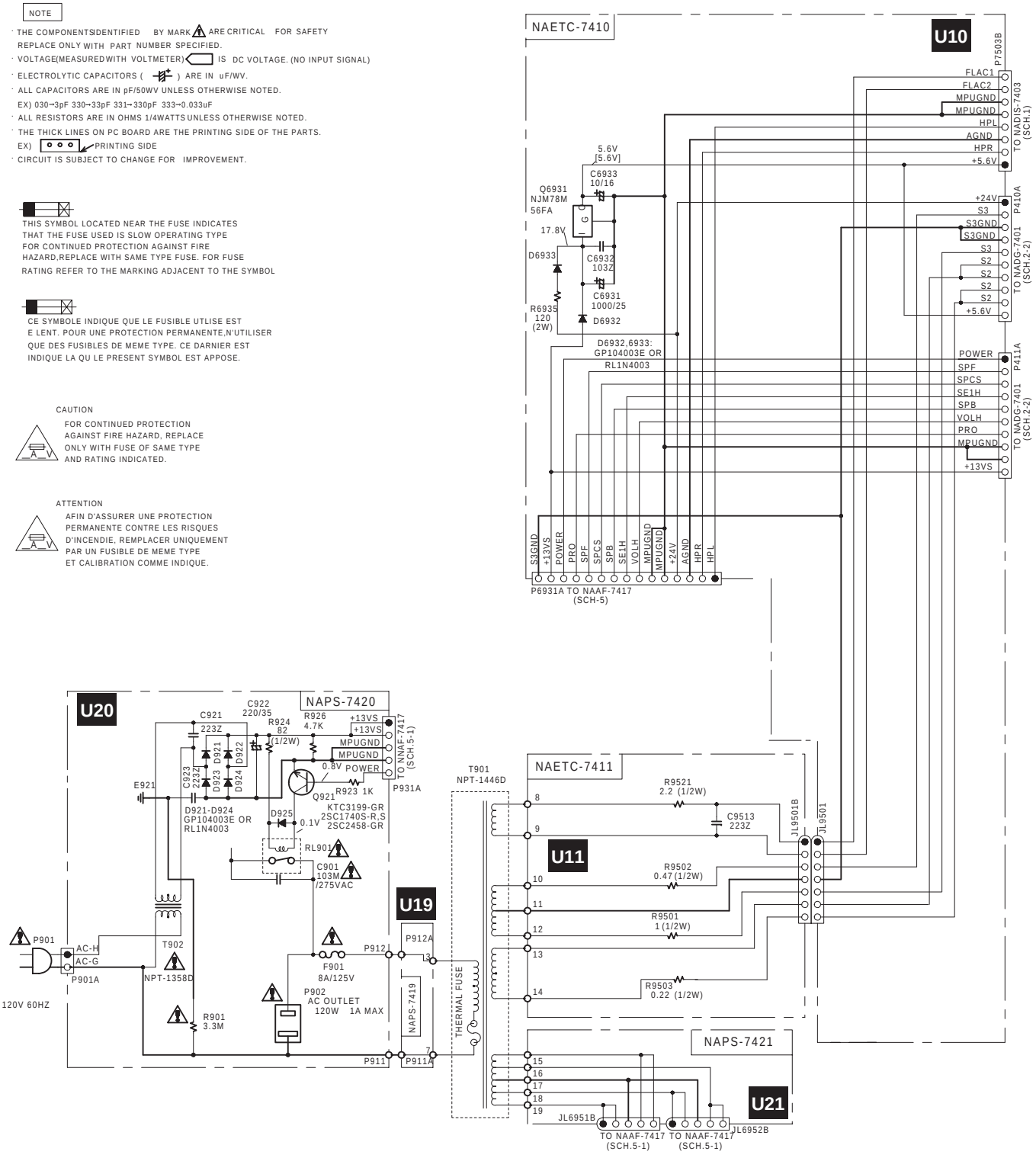
CE SYMBOLE INDIQUE QUE LE FUSIBLE UTLISE EST E LENT. POUR UNE PROTECTION PERMANENTE,N'UTILISER QUE DES FUSIBLES DE MEME TYPE. CE DARNIER EST INDIQUE LA QU LE PRESENT SYMBOL EST APPOSE.

CAUTION

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH FUSE OF SAME TYPE AND RATING INDICATED.

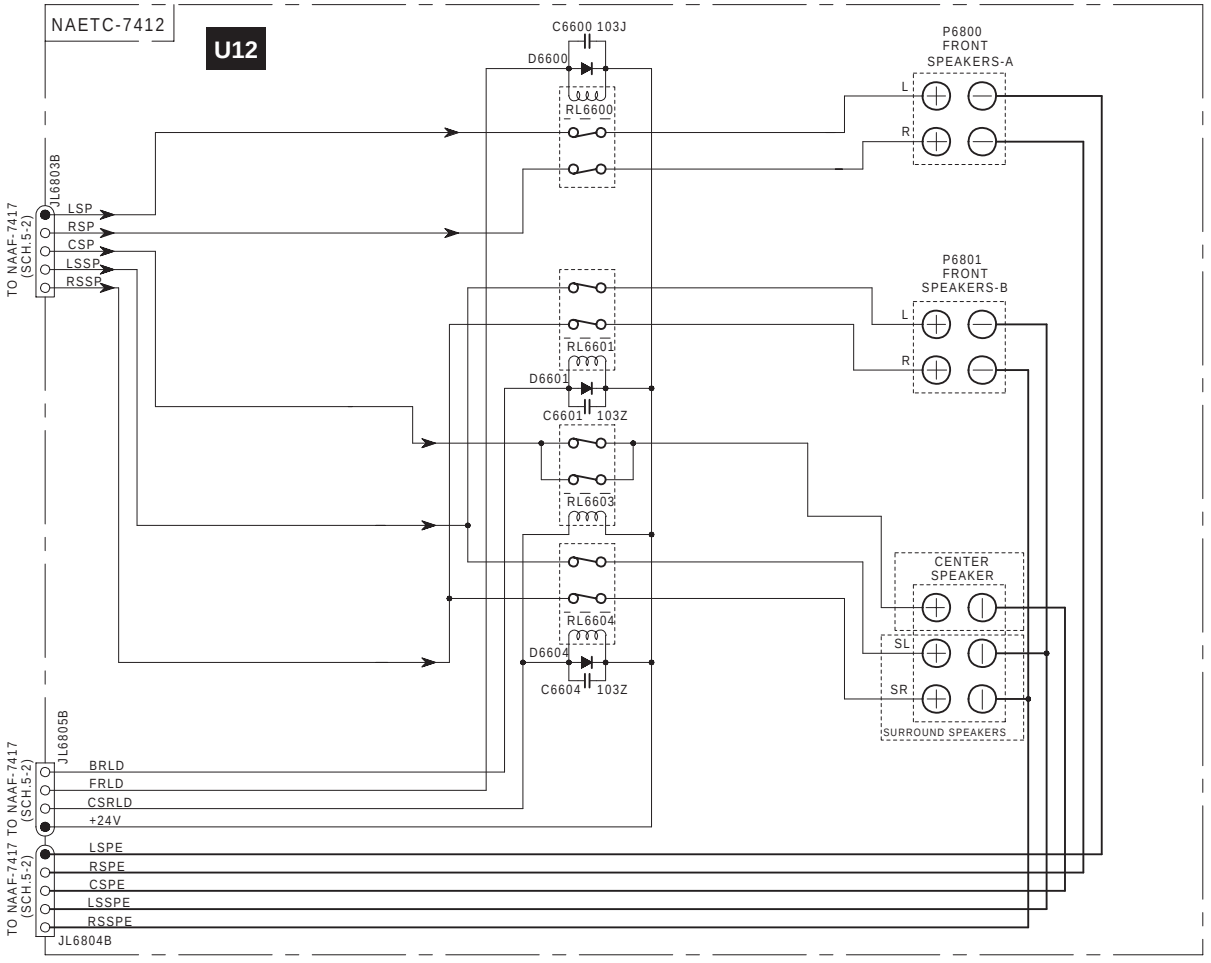
ATTENTION

AFIN D'ASSURER UNE PROTECTION PERMANENTE CONTRE LES RISQUES D'INCENDIE, REMPLACER UNIQUEMENT PAR UN FUSIBLE DE MEME TYPE ET CALIBRATION COMME INDIQUE.

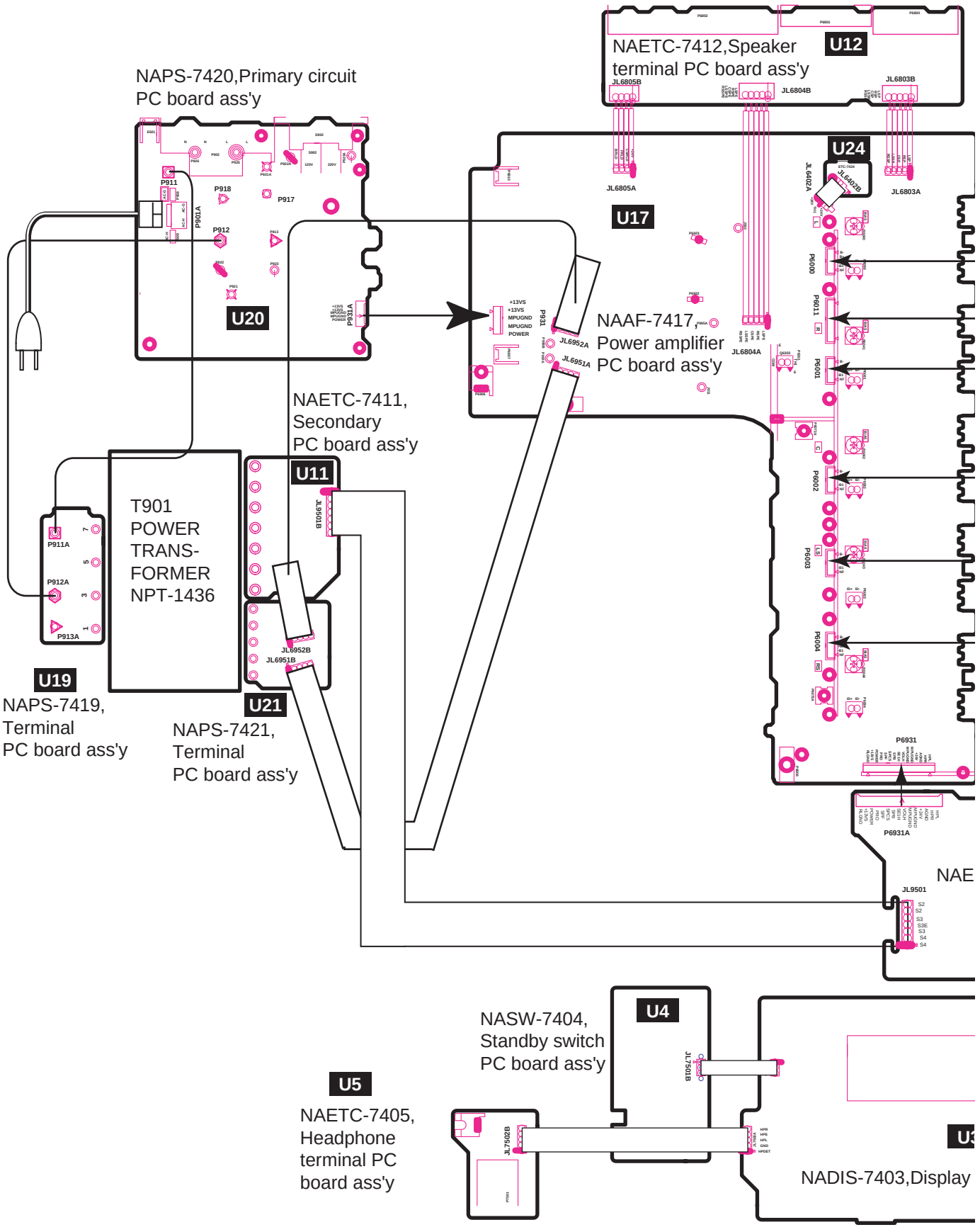


# SCHEMATIC DIAGRAM 7

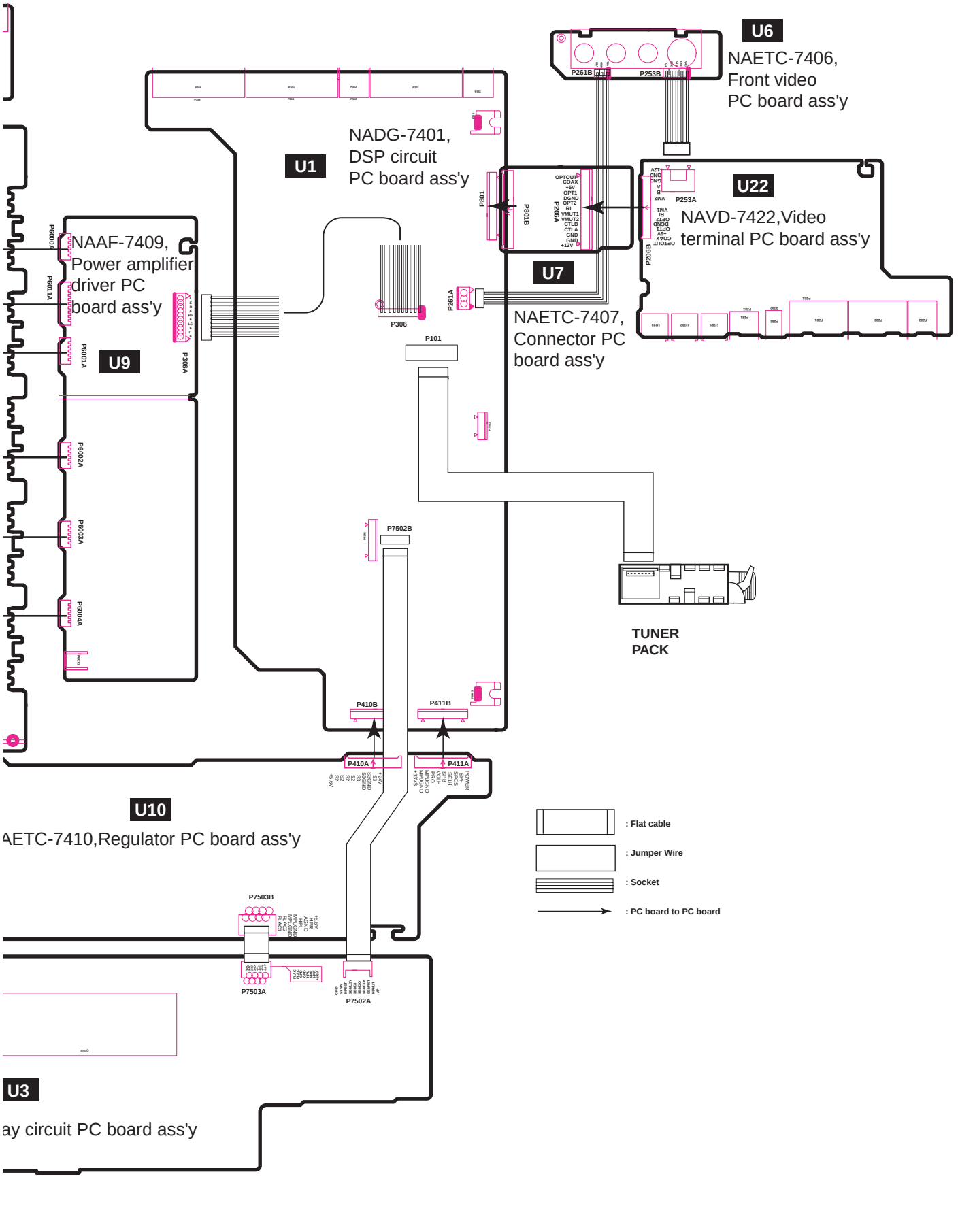
## Speaker terminal section



# WIRING VIEW

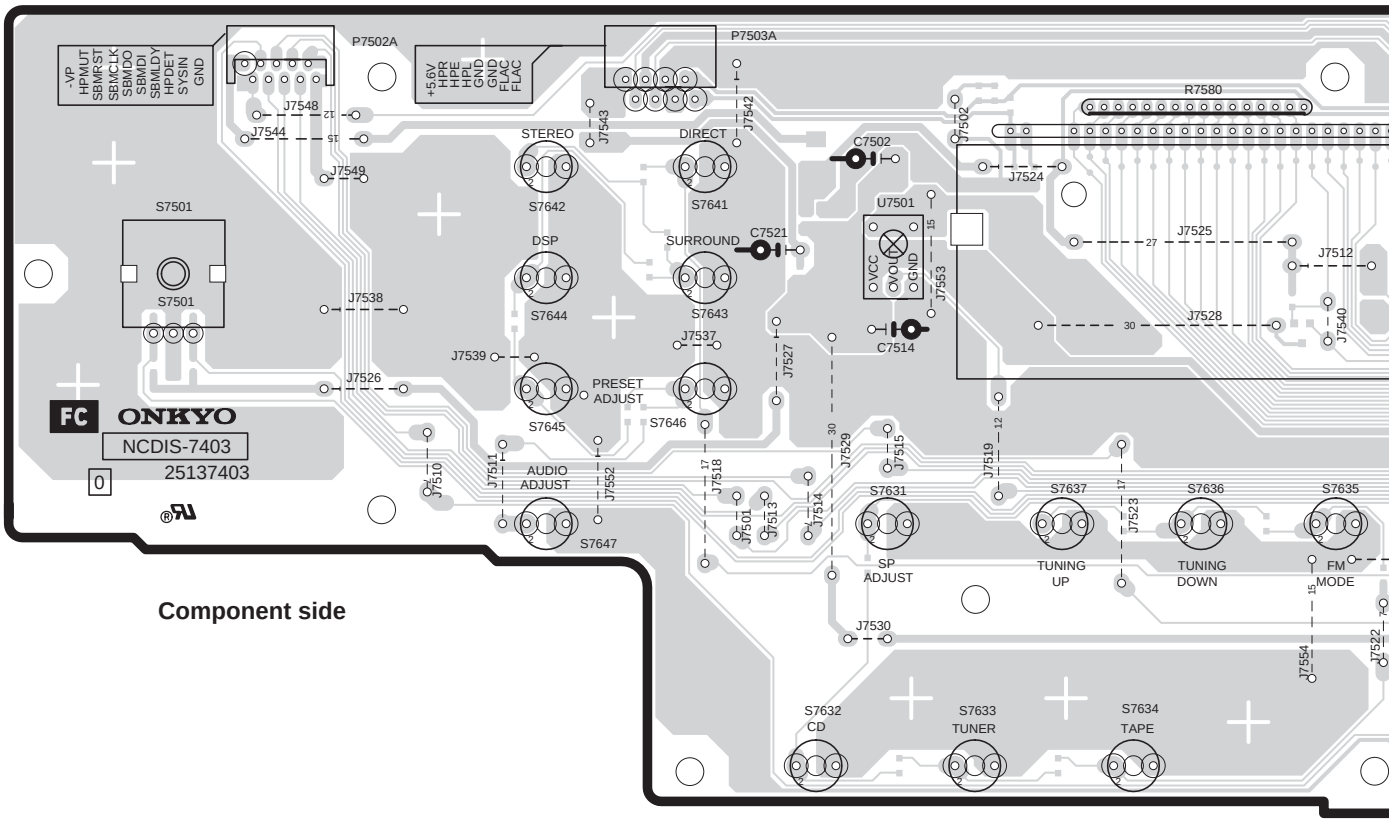

A
B
C
D
1
2
3
4
5
NAETC-7412,Speaker terminal PC board ass'y
U12
JL6805B
JL6804B
JL6803B
NAPS-7420,Primary circuit PC board ass'y
U20
U17
U24
JL6805A
JL6803A
JL6402A
JL6402B
JL6804A
NAAF-7417, Power amplifier PC board ass'y
NAETC-7411, Secondary PC board ass'y
U11
JL6952A
JL6951A
JL6952B
JL6951B
T901 POWER TRANS-FORMER NPT-1436
U19
NAPS-7419, Terminal PC board ass'y
U21
NAPS-7421, Terminal PC board ass'y
P6931
P6931A
JL9501
NAE
U4
NASW-7404, Standby switch PC board ass'y
JL7503B
U5
NAETC-7405, Headphone terminal PC board ass'y
JL7502B
NADIS-7403,Display

# WIRING VIEW

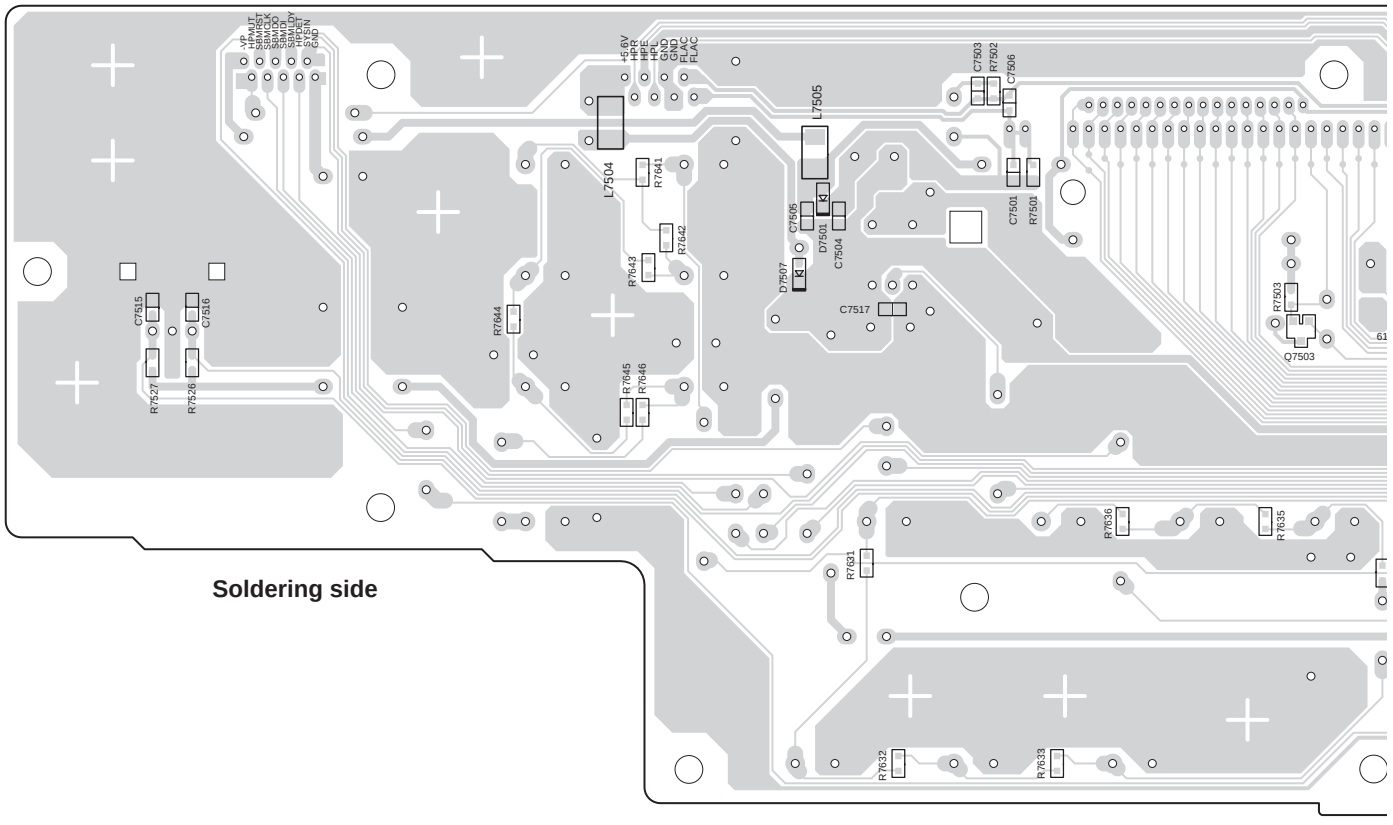

A
B
C
D
1
2
3
4
5
U6
NAETC-7406,
Front video
PC board ass'y
U1
NADG-7401,
DSP circuit
PC board ass'y
U22
NAVD-7422,Video
terminal PC board ass'y
U7
NAETC-7407,
Connector PC
board ass'y
NAAF-7409,
Power amplifier
driver PC
board ass'y
U9
TUNER
PACK
U10
AETC-7410,Regulator PC board ass'y
U3
ay circuit PC board ass'y
: Flat cable
: Jumper Wire
: Socket
: PC board to PC board

# PRINTED CIRCUIT BOARD VIEW 1 FROM SOLDERING SIDE

**U3** **NADIS-7403,Display circuit PC board**



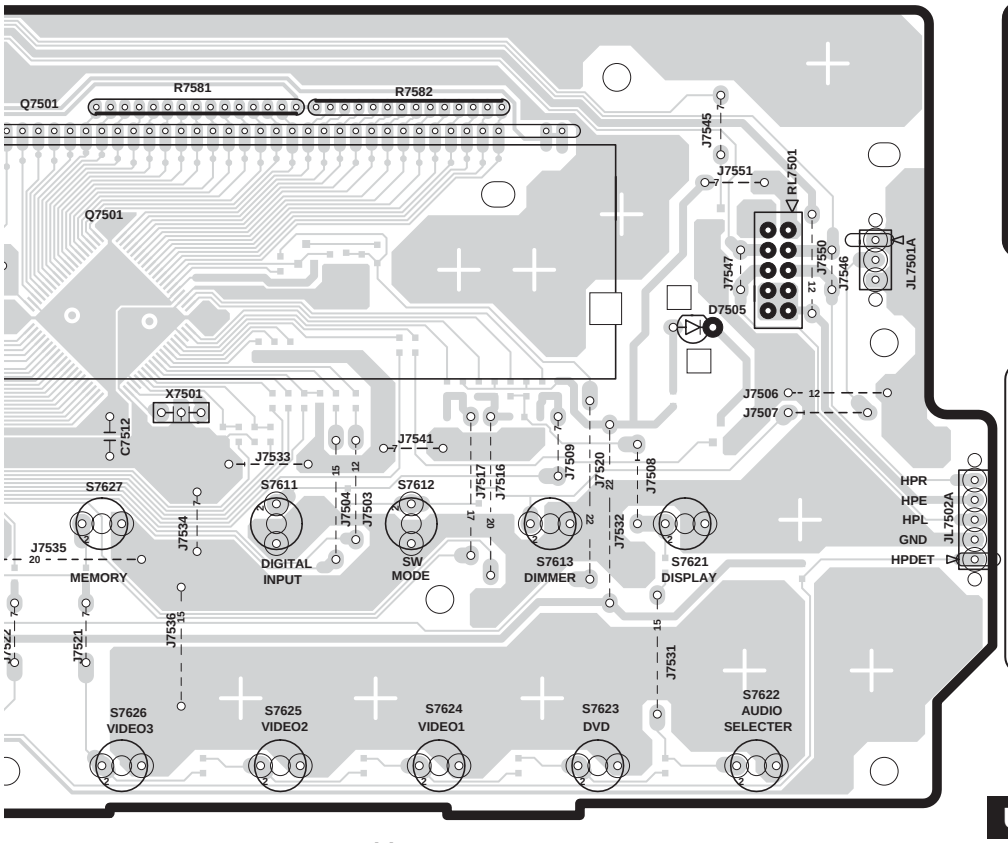

**Component side**




**Soldering side**

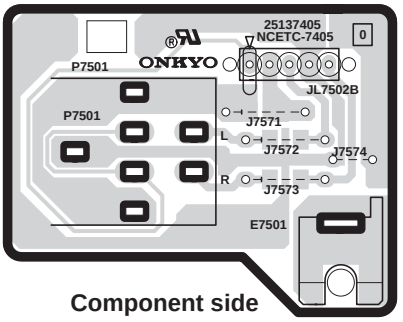
# PRINTED CIRCUIT BOARD VIEW 1-2 FROM SOLDERING SIDE

**U3** NADIS-7403,Display circuit PC board

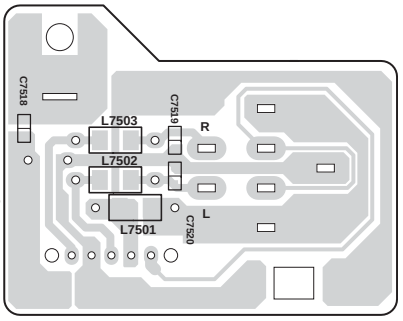



Componet side

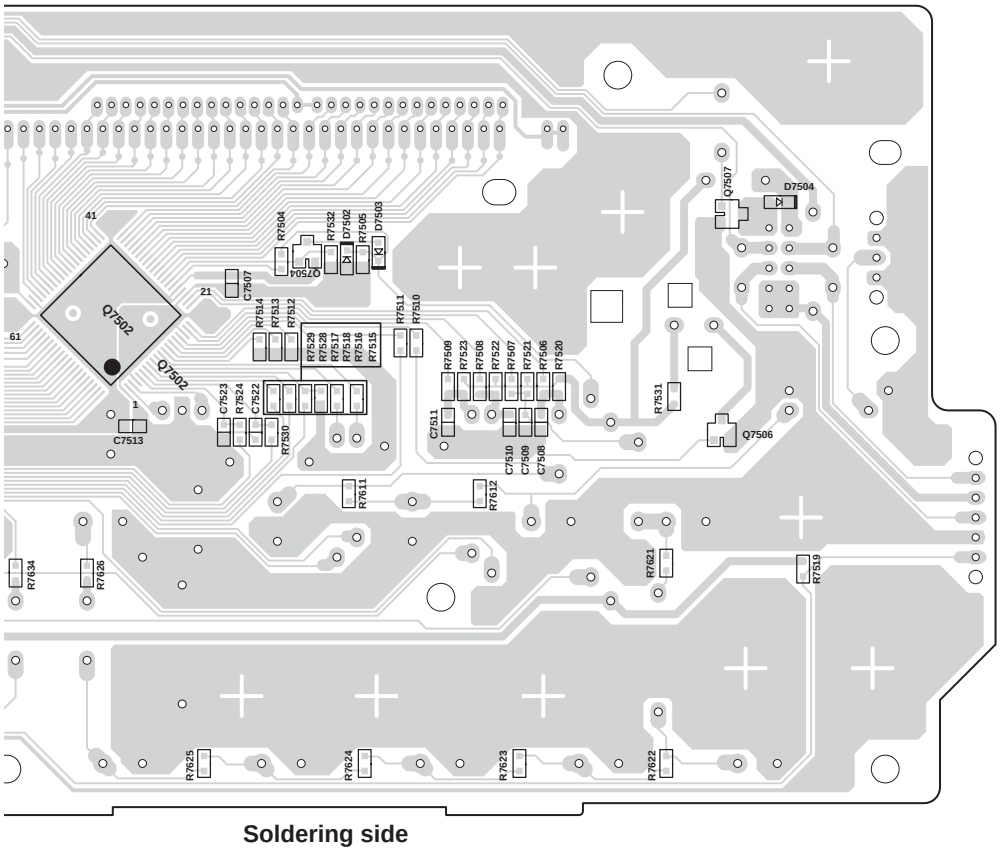
**U5** NAETC-7405,Headphone terminalPC board




Component side

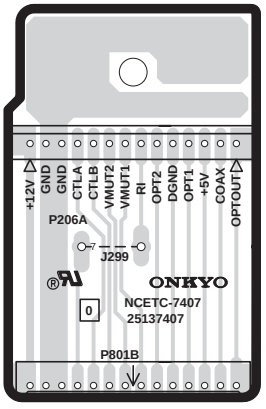



Soldering side

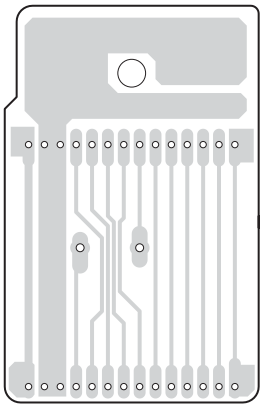



Soldering side

**U7** NAETC-7407,Connector PC board




Componet side

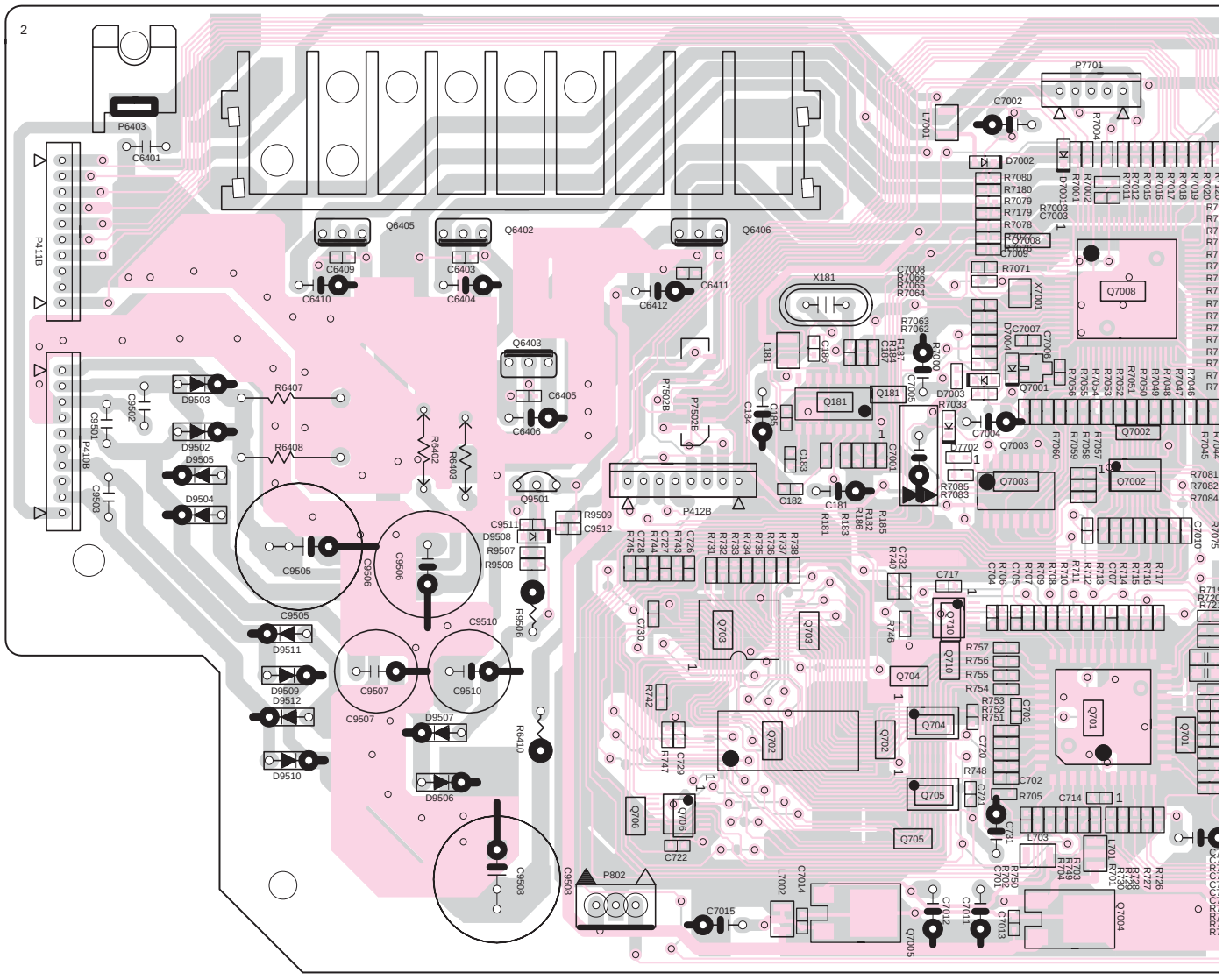


Soldering side

# PRINTED CIRCUIT BOARD 2-1

**U1** NADG-7401,DSP circuit PC board

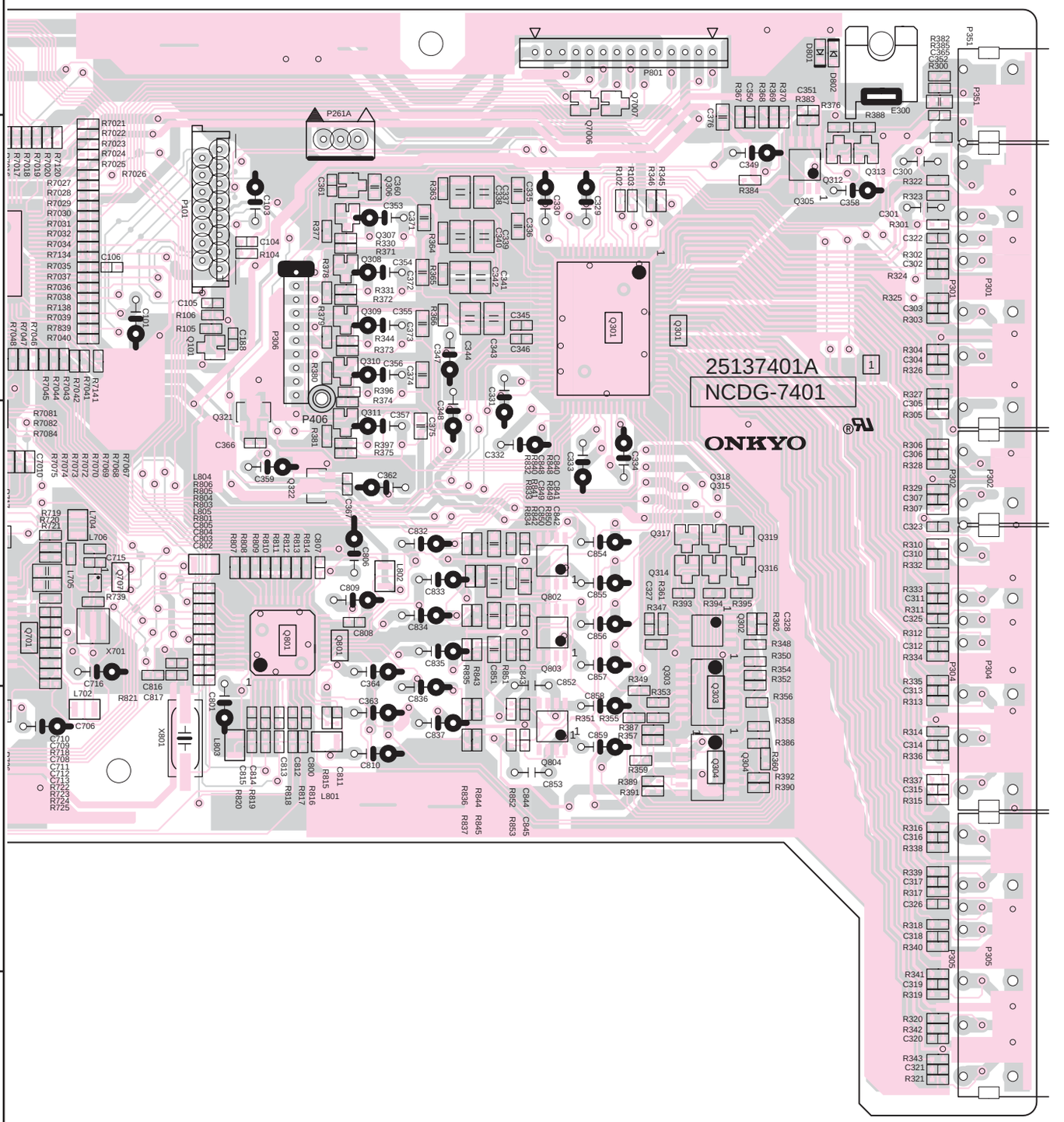
Pink:Parts and Copper foil side
Black:Copper foil side



# PRINTED CIRCUIT BOARD 2-2

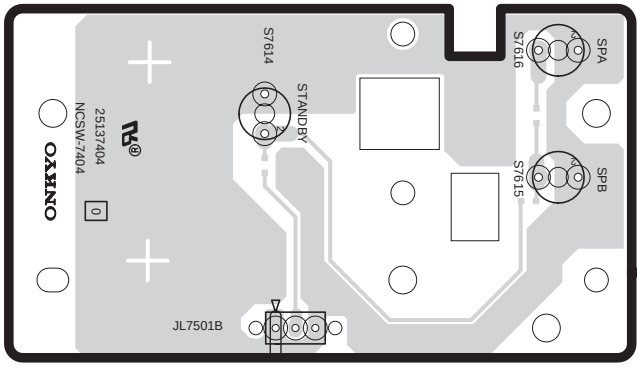
**U1** NADG-7401,DSP circuit PC board

**Pink:Parts and Copper foil side**
**Black:Copper foil side**

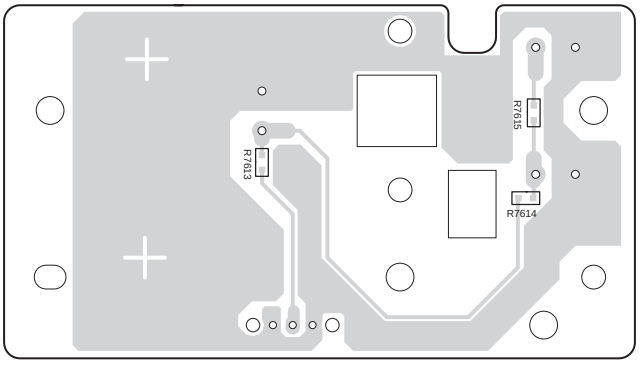


# PRINTED CIRCUIT BOARD VIEW 6 FROM SOLDERING SIDE

## U4 NASW-7404,Standby switch PC board

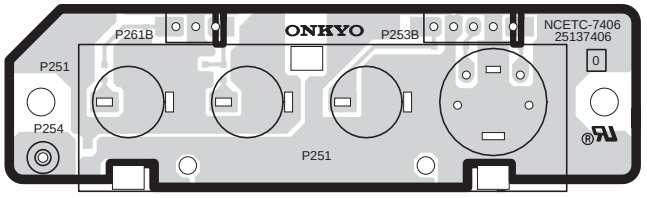



Component side

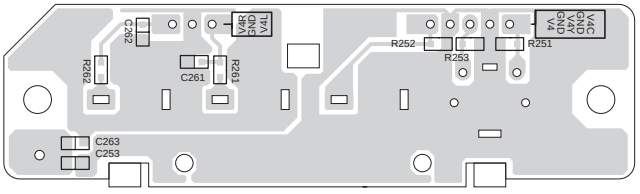



Sodlering side

## U6 NAETC-7406,Front video PC board

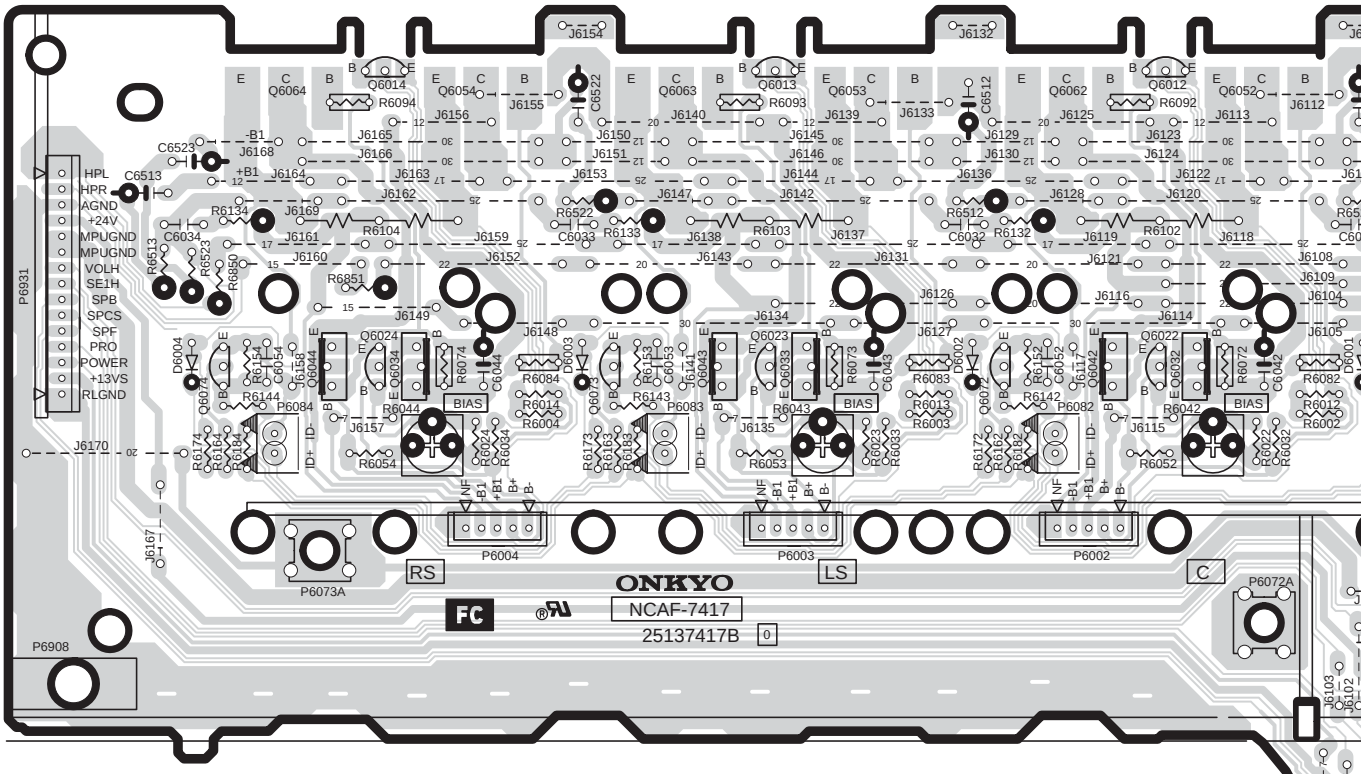



Component side



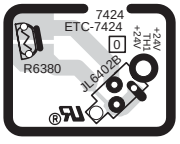

Soldering side

# PRINTED CIRCUIT BOARD VIEW 4-1 FROM SOLDERING SIDE

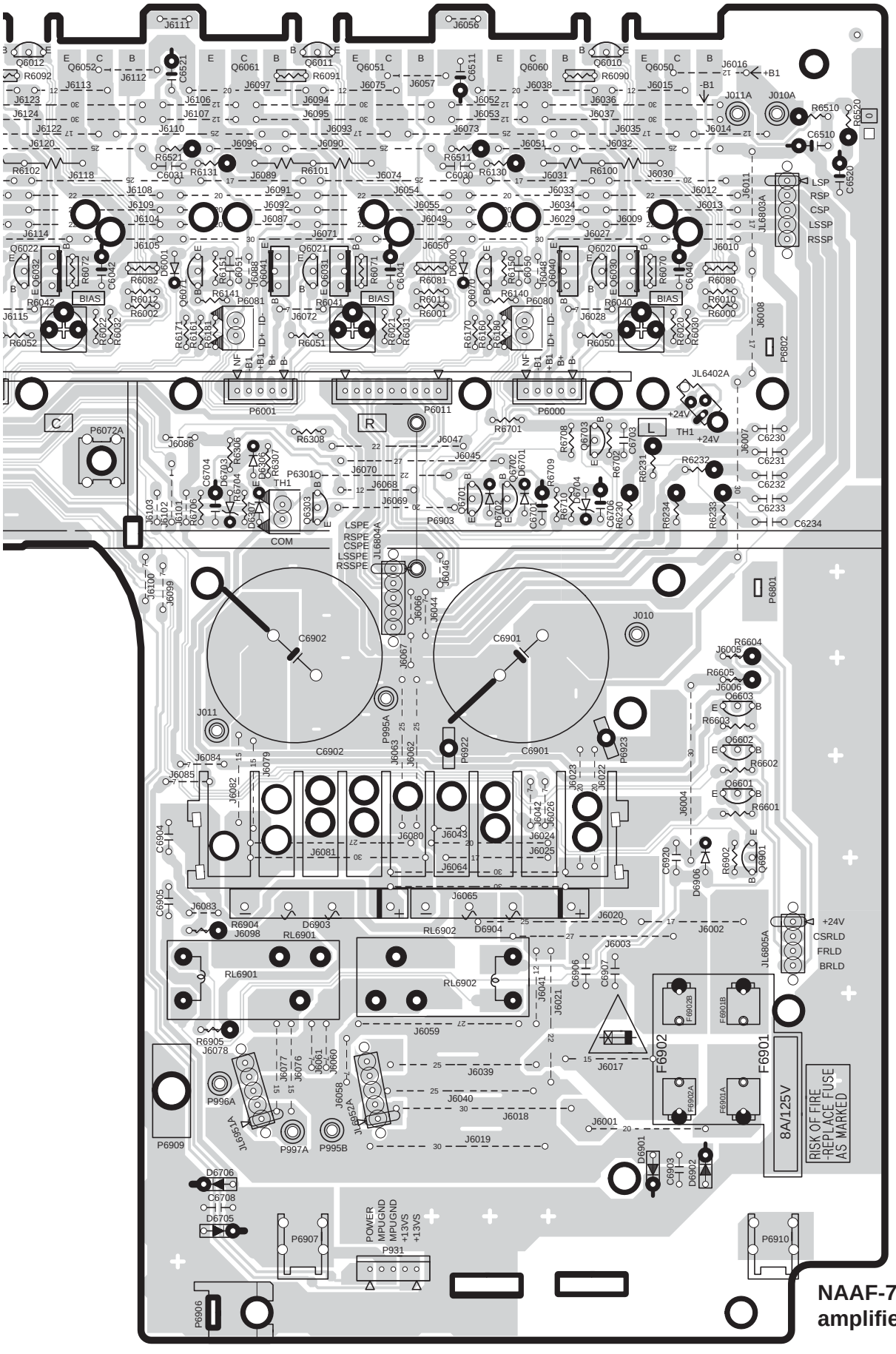



**U17** **NAAF-7417,Power amplifier PC board**

**U24** **NAETC-7424,Thermal detector circuit PC board**



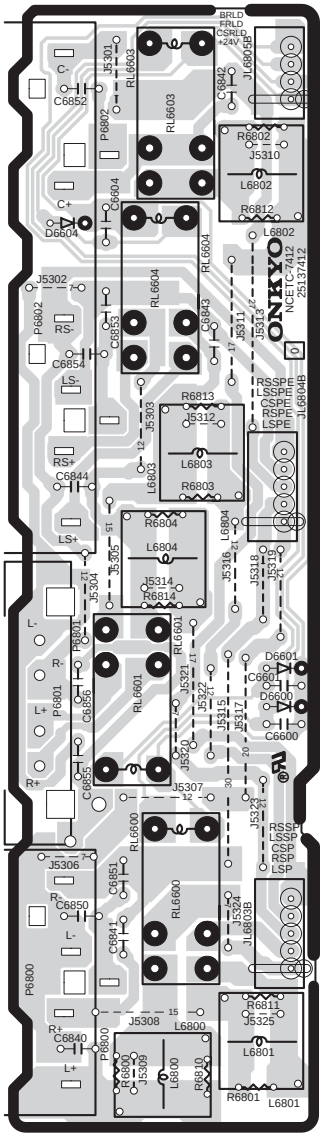
# PRINTED CIRCUITBOARD VIEW 4-2 FROM SOLDERONG SIDE




**U17**

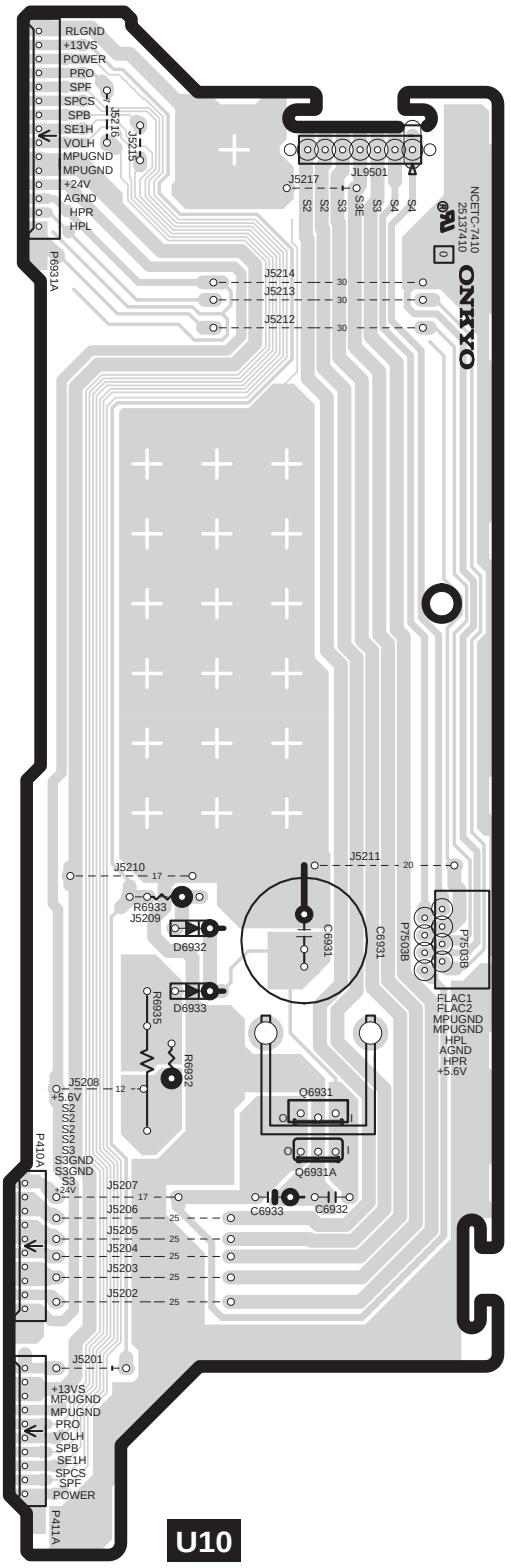
**NAAF-7417,Power amplifier PC board**

# PRINTED CIRCUIT BOARD VIEW 5-1 FROM SOLDERING SIDE




**U12**

**NAETC-7412,Speaker terminal PC board**




**U10**

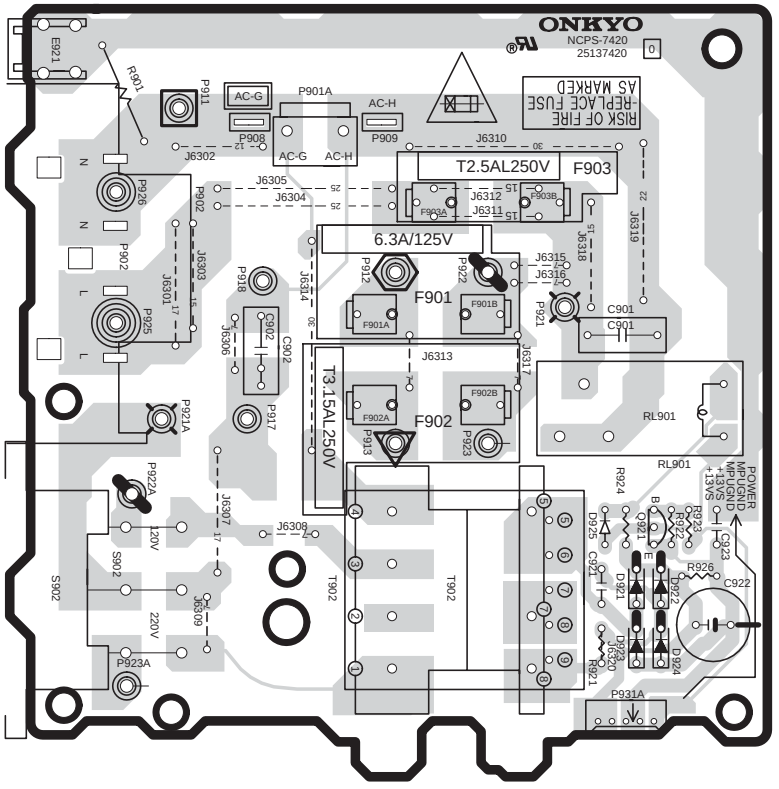
**NAETC-7410,Regulator PC board**

A B C D

1 2 3 4 5

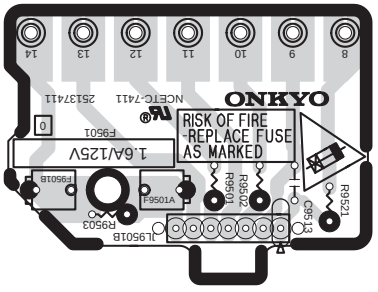
# PRINTED CIRCUIT BOARD VIEW 5-2 FROM SOLDERING SIDE

U20



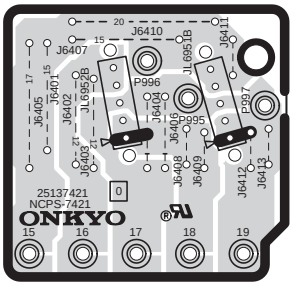

NAPS-7420,Primary circuit PC board

U11



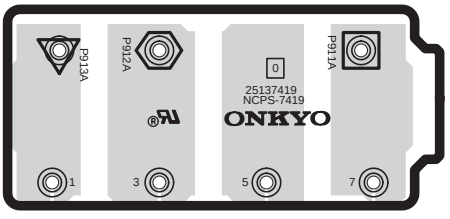

NAETC-7411,Secondary PC board

U21




NAPS-7421,Terminal PC board

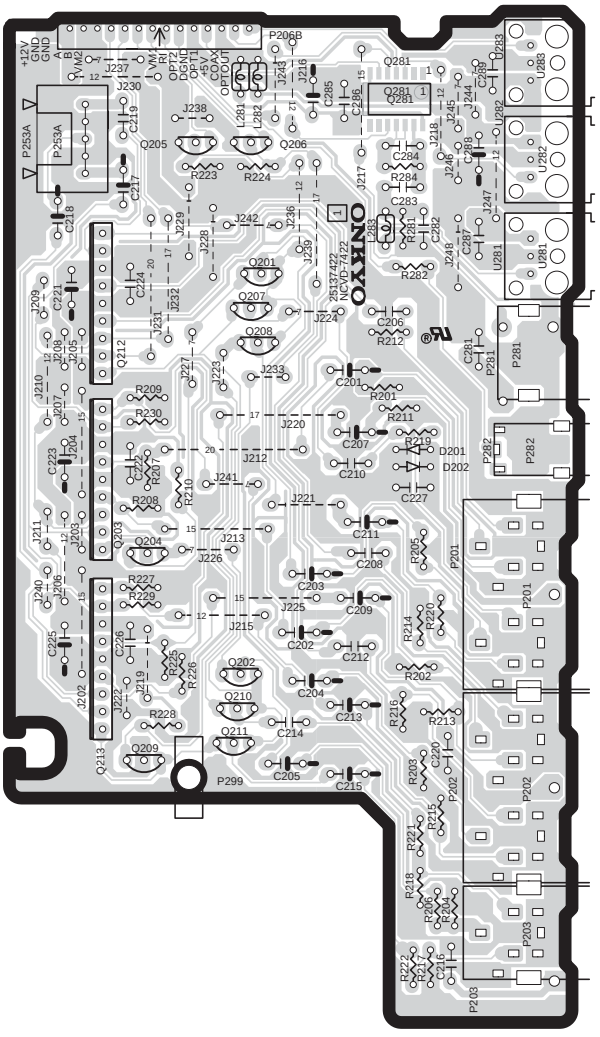
U19




NAPS-7419,Terminal PC board

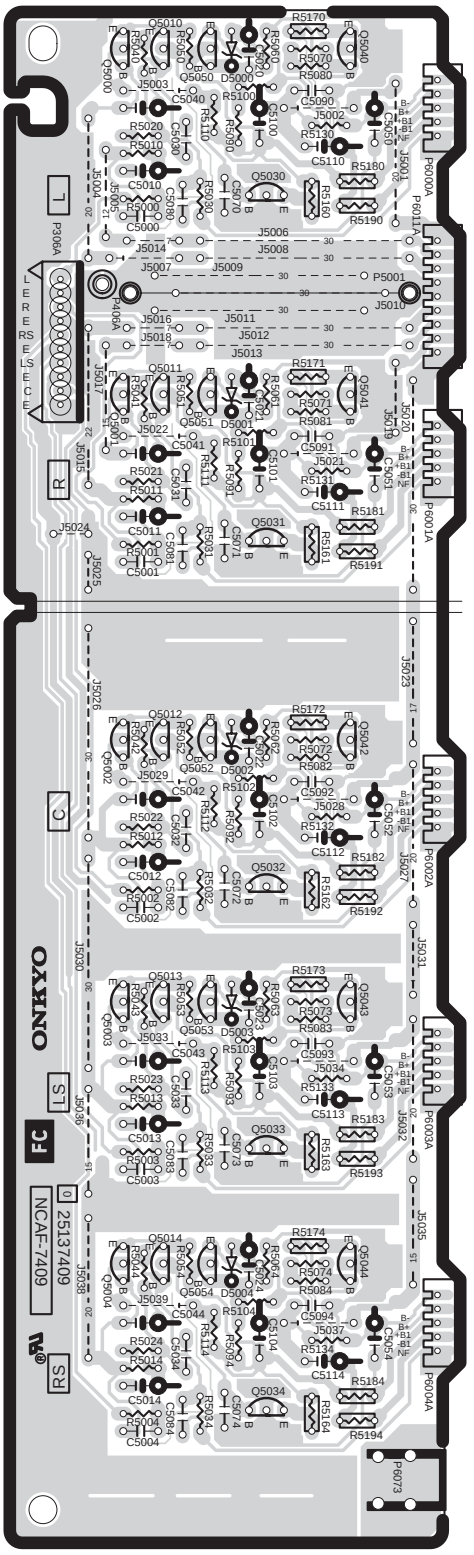
# PRINTED CIRCUIT BOARD VIEW 3 FROM SOLDERING SIDE

U22



NAVD-7422,Video terminal PC board

U9



NAAF-7409, Power amplifier driver PC board

# PRINTED CIRCUIT BOARD-PARTS LIST 1

**DSP CIRCUIT PC BOARD(NADG-7401-1F)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **ICs** | |
| Q301 | 22241761R3 | BD3811K1 |
| Q302,Q305 | 22241383R2, | NJM4565M-D, |
| Q802~Q804 | 22240489R1NE or | MPC4570G2-T1(MST) or |
| | 22240581R2 | NJM4565M |
| Q321 | 222780073R2 | 78L07(SMT) |
| Q322 | 222790073R2 | 79L07(SMT) |
| Q6402,Q6405 | 222780125 | 78M12HF |
| Q6403 | 222790125 | 79M12HF |
| Q6406 | 222780055 | 78M05HF |
| Q7002 | 22274541ER2TO or | TC74VHC541FT or |
| | 22274541IR2TI | SN74AHC541PWR |
| Q7003 | 222740077R2TO | TC74HCT7007AF |
| Q7004 | 22278025DR2NE or | MPC2925T or |
| | 22278025DR2JR | NJM2391DL1-25 |
| Q7005 | 22278033DR2NE or | MPC2933T or |
| | 22278033DR2JR | NJM2391DL1-33 |
| Q7008 | 22241881R3 or | MPD784225GC-183-8BT or |
| | 22241766R3 | MPD78F4225 (No spare part) |
| Q701 | 22241762R2 | CS493264 |
| Q707 | 22240935R2 | TC7WU04FU |
| Q801 | 22241620R3 | AK4586 |
| | **Transistors** | |
| Q306 | 2214530R2 or | RN2402 or |
| | 2216220R2 | KRA102S |
| Q307,Q308 | 2215410R2 | RN1441 |
| Q312,Q313 | 2215410R2 | RN1441 |
| Q7001 | 2214490R2 or | RN1404 or |
| Q7006,Q7007 | 2216210R2 | KRC104S |
| Q9501 | 2211455 | 2SA1015-GR |
| | **Diodes** | |
| D7001~D7004 | 223234R2 or | 1SS352 or |
| D801,D802 | 223269R2 | 1SS355 |
| D7702 | 224660624R2, | HZU6.2B, |
| | 224490620R2 or | UDZ6.2B or |
| | 224550620R2 | UDZS6.2B |
| D9502~D9507 | 22380260, | RL1N4003, |
| D9509~D9512 | 22380032 or | 1SR139-100 or |
| | 22380035 | GP104003E |
| D9508 | 224662704R2, | HZU27B, |
| | 224492700R2 or | UDZ27B or |
| | 224552700R2 | UDZS27B |
| | **Coils** | |
| L7001,L7002 | 231237K470R2 | NCH-1479 |
| L701,L702 | 231237M022R2 | NCH-1471 |
| L703 | 231237K470R2 | NCH-1479 |
| L704 | 231237M022R2 | NCH-1471 |
| L705,L706 | 230958R1 | BK1608LM182-T |
| L801~L804 | 231237M022R2 | NCH-1471 |
| L805 | 230958R1 | BK1608LM182-T |
| | **Oscillators** | |
| X7001 | 3010361R2 | CSTCE12M5G52-R0 |
| X701 | 3010324R2 | CSTCV12.2MTJ0C4 |
| | **Capacitors** | |
| C101,C103 | 394680337 | 3.3uF,50V,Elect. |
| C300,C301 | 374721015 | 100pF+/-10%,50V,Plastic |
| C329~C334 | 393341007 | 10uF,16V,Elect. |
| C335,C336 | 373043324R2 | 3300pF+/-5%,16V,Plastic |
| C338,C340 | 373045634R2 | 0.056uF+/-5%,16V,Plastic |
| C347,C348 | 394641017 | 100uF,16V,Elect. |
| C349 | 393341007 | 10uF,16V,Elect. |
| C353,C354 | 393344707 | 47uF,16V,Elect. |
| C358 | 393344707 | 47uF,16V,Elect. |
| C359,C362 | 394641007 | 10uF,16V,Elect. |

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Capacitors** | |
| C363,C364 | 393341007 | 10uF,16V,Elect. |
| C6401 | 374721044 | 0.1uF+/-5%,50V,Plastic |
| C6404,C6406 | 394641007 | 10uF,16V,Elect. |
| C6410,C6412 | 394641007 | 10uF,16V,Elect. |
| C7001 | 3000078, | DX-5R5L104, |
| | 3000120 or | FMC0H104Z or |
| | 3000121 | SCDA5R5104A,Super |
| C7002,C7005 | 394621017 | 100uF,6.3V,Elect. |
| C7004 | 394680107 | 1uF,50V,Elect. |
| C7011,C7012 | 394644707 | 47uF,16V,Elect. |
| C7015 | 394644707 | 47uF,16V,Elect. |
| C706,C716 | 394621017 | 100uF,6.3V,Elect. |
| C731 | 394621017 | 100uF,6.3V,Elect. |
| C801,C810 | 394644707 | 47uF,16V,Elect. |
| C806 | 394622217 | 220uF,6.3V,Elect. |
| C809 | 394641007 | 10uF,16V,Elect. |
| C832~C837 | 393341007 | 10uF,16V,Elect. |
| C841 | 373048224R2 | 8200pF+/-5%,16V,Plastic |
| C849 | 373041534R2 | 0.015uF+/-5%,16V,Plastic |
| C852,C853 | 374721524 | 1500pF+/-5%,50V,Plastic |
| C854 | 393341007 | 10uF,16V,Elect. |
| C855 | 393344707 | 47uF,16V,Elect. |
| C856~C859 | 393341007 | 10uF,16V,Elect. |
| C9501~C9503 | 374721044 | 0.1uF+/-5%,50V,Plastic |
| C9505 | 394662227 | 2200uF,35V,Elect. |
| C9506 | 394664717 | 470uF,35V,Elect. |
| C9507 | 394662217 | 220uF,35V,Elect. |
| C9508 | 394644727 | 4700uF,16V,Elect. |
| C9510 | 394672217 | 220uF,63V,Elect. |
| | **Resistors** | |
| R6402 | 442521004 | 10ohm+/-5%,1/2W,Metal oxide |
| R6403 | 442523304 | 33ohm+/-5%,1/2W,Metal oxide |
| R6407 | 452630334 | 3.3ohm+/-5%,1W,Metal |
| R6410 | 453530224 | 2.2ohm+/-5%,1/2W,Metal |
| R9506 | 443522204 | 22ohm+/-5%,1/2W,Metal oxide |
| | **Terminals** | |
| P301,P304 | 25045571 or | NPJ-6PDRW386 or |
| | 25045300 | NPJ-6PDBL159 |
| P305 | 25045572 or | NPJ-6PDBRW387 or |
| | 25045649 | NPJ-6PDBRW453 |
| P351 | 25045567 | NPJ-1PDBL382 |
| | **Sockets** | |
| P101 | 25052211 or | NSCT-15P2108 or |
| | 25052024 | NSCT-15P1811 |
| P7502B | 25052576R2 | NSCT-10P2473 |
| P306 | 2009990717UL | NSAS-20P1004 |
| | **Plugs** | |
| P261A | 25055133 | NPLG-3P117 |
| P410B,P411B | 25055706 | NPLG-10P662 |
| P801 | 25055710 | NPLG-14P666 |
| | **Radiator** | |
| Q6402B | 27160500 | RAD-165 |
| | **Screws** | |
| Q6402A | 82143010 | 3P+10FN(BC),Pan head |

**DISPLAY CIRCUIT PC BOARD(NADIS-7403-1A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **FL tube** | |
| Q7501 | 212229 | HNA-16MM39T |
| | **Remote sensor** | |
| U7501 | 241341 | SPS-444-1-E1 |
| | **IC** | |
| Q7502 | 22241571R3 | MPD780232GC-030-8BT |

# PRINTED CIRCUIT BOARD-PARTS LIST 2

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Transistors** | |
| Q7504 | 2216230R2 or | KRA103S or |
| | 2214540R2 | RN2403 |
| Q7506 | 2216190R2 or | KRC102S or |
| | 2214470R2 | RN1402 |
| | **Diodes** | |
| D7501 | 224490820R2, | UDZ8.2B, |
| | 224550820R2 or | UDZS8.2B or |
| | 224660824R2 | HZU8.2B |
| D7502 | 224490510R2, | UDZ5.1B, |
| | 224550510R2 or | UDZS5.1B or |
| | 224660514R2 | HZU5.1B |
| D7503,D7507 | 223234R2 or | 1SS352 or |
| | 223269R2 | 1SS355 |
| D7505 | 225290 | SEL4110R |
| | **Coils** | |
| L7504,L7505 | 231237K220R2 | NCH-1477 |
| | **Oscillator** | |
| X7501 | 3010242 | CST5.00MGW |
| | **Capacitors** | |
| C7502 | 355783309 | 33uF,50V,Elect. |
| C7514 | 394621017 | 100uF,6.3V,Elect. |
| C7521 | 355722219 | 220uF,6.3V,Elect. |
| | **Switches** | |
| S7501 | 25065627 | EC12E2425,Rotary |
| S7611~S7613 | 25035699 or | NPS-111-S662 or |
| S7621~S7627 | 25035714 | NPS-111-S677 |
| S7631~S7637 | 25035699 or | NPS-111-S662 or |
| S7641~S7647 | 25035714 | NPS-111-S677 |
| | **Sockets** | |
| JL7501A | 25051107 | NSCT-3P894 |
| JL7502A | 25051109 | NSCT-5P896 |
| P7502A | 25051892 or | NSCT-10P1679 or |
| | 25052477 | NSCT-10P2374 |
| P7503A | 25052054 or | NSCT-8P1841 or |
| | 25051852 | NSCT-8P1639 |
| | **Holder** | |
| Q7501A | 27190989A | (FL) |

**STANDBY SWITCH PC BOARD(NASW-7404-1A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| S7614~S7616 | 25035699 or | NPS-111-S662 or |
| | 25035714 | NPS-111-S677,Switch |
| JL7501B | 25051107 | NSCT-3P894,Socket |

**HEADPHONE TERMINAL PC BOARD(NAETC-7405-1A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| P7501 | 25045514 | YKB26-5005,Terminal |
| JL7502B | 25051109 | NSCT-5P896,Socket |

**FRONT VIDEO PC BOARD (NAETC-7406-1A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| P251 | 25045680 | NPJ-7PDB477,Terminal |
| P253B | 2009990578UL | NSAS-10P0787,Socket |
| P261B | 2009990513UL | NSAS-6P0675,Socket |

**CONNECTOR PC BOARD (NAETC-7407-1A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| P801B | 25051239 | NSCT-14P1029,Socket |
| P206A | 25055710 | NPLG-14P666,Plug |

CAUTION: Replacement for transistor of mark *, if necessary must be made from the same beta group ($h_{FE}$) as the original type.

**POWER AMPLIFIER DRIVER PC BOARD (NAAF-7409-2A)**

| CIRCUIT NO. | PART NO. | | DESCRIPTION |
|---|---|---|---|
| | **Transistors** | | |
| Q5000~Q5004 | 2215896, | * | KTC3200-BL, |
| Q5010~Q5014 | 2210755, | * | 2SC1775A-E, |
| | 2210756 or | * | 2SC1775A-F or |
| | 2211733 | * | 2SC1845-E |
| Q5030~Q5034 | 2215844, | | KTA1024-Y, |
| | 2211353, | | 2SA949-O, |
| | 2211354 or | | 2SA949-Y or |
| | 2215843 | | KTA1024-O |
| Q5040~Q5044 | 2215854, | | KTC3206-Y, |
| | 2211633, | | 2SC2229-O, |
| | 2211634 or | | 2SC2229-Y or |
| | 2215853 | | KTC3206-O |
| Q5050~Q5054 | 2215896, | | KTC3200-BL |
| | 2210755, | | 2SC1775A-E, |
| | 2210756, | | 2SC1775A-F, |
| | 2211732, | | 2SC1845-F, |
| | 2211733 or | | 2SC1845-E or |
| | 2215895 | | KTC3200-GR |
| | **Diodes** | | |
| D5000~D5004 | 224470562 | | MTZJ5.6B |
| | **Capacitors** | | |
| C5000~C5004 | 374721015 | | 100pF+/-10%,50V,Plastic |
| C5010~C5014 | 393341017 | | 100uF,16V,Elect. |
| C5020~C5024 | 394681007 | | 10uF,50V,Elect. |
| C5040~C5044 | 393342217 | | 220uF,16V,Elect. |
| C5050~C5054 | 394684707 | | 47uF,50V,Elect. |
| C5100~C5104 | 394691007 | | 10uF,100V,Elect. |
| C5110~C5114 | 394691007 | | 10uF,100V,Elect. |
| | **Resistors** | | |
| R5160~R5164 | 415471214 | | 120ohm+/-5%,1/4W,NF carbon |
| R5170~R5174 | 415471214 | | 120ohm+/-5%,1/4W,NF carbon |
| R5180~R5184 | 415471004 | | 10ohm+/-5%,1/4W,NF carbon |
| R5190~R5194 | 415471004 | | 10ohm+/-5%,1/4W,NF carbon |
| | **Sockets** | | |
| P6000A~P6004A | 25052288 | | NSCT-5P2185 |
| P6011A | 25052292 | | NSCT-9P2189 |
| | **Plug** | | |
| P306A | 25055154 | | NPLG-10P138 |

**REGULATOR PC BOARD (NAETC-7410-2A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **IC** | |
| Q6931 | 222780565JRC | NJM78M56FA |
| | **Diodes** | |
| D6932,D6933 | 22380260 or | RL1N4003 or |
| | 22380035 | GP104003E |
| | **Capacitors** | |
| C6931 | 394651027 | 1000uF,25V,Elect. |
| C6933 | 394641007 | 10uF,16V,Elect. |
| | **Resistor** | |
| R6935 | 441721214 | 120ohm+/-5%,2W,Metal oxide |
| | **Sockets** | |
| JL9501A | 25051111 | NSCT-7P898 |
| P410A,P411A | 25051235 | NSCT-10P1025 |
| P6931A | 25051240 | NSCT-15P1030 |
| P7503B | 25052241, | NSCT-8P2138, |
| | 25051312, | NSCT-8P1101, |
| | 25051852 or | NSCT-8P1639 or |
| | 25052054 | NSCT-8P1841 |

# PRINTED CIRCUIT BOARD-PARTS LIST 3

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

**SECONDARY PC BOARD (NAETC-7411-2A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Resistors** | |
| R9501 | 453530104 | 1ohm+/-5%,1/2W,Metal |
| R9502 | 453534794 | 0.47ohm+/-5%,1/2W,Metal |
| R9503 | 453532294 | 0.22ohm+/-5%,1/2W,Metal |
| R9521 | 453530224 | 2.2ohm+/-5%,1/2W,Metal |
| | **Socket** | |
| JL9501B | 25051111 | NSCT-7P898 |

**SPEAKER TERMINAL PC BOARD (NAETC-7412-2A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Diodes** | |
| D6600,D6601 | 223163, | 1SS133, |
| D6604 | 223205 or | 1SS270A or |
| | 223222 | WG713A |
| | **Capacitor** | |
| C6600 | 374721034 | 0.01uF+/-5%,50V,Plastic |
| | **Terminals** | |
| P6800 | 25060315 | NTM-4PDMN246 |
| P6801 | 25060317 | NTM-4PDML248 |
| P6802 | 25060318 | NTM-6PDMN249 |
| | **Relays** | |
| RL6600,RL6601 | 25065563, | NRL-2P5A-DC24-129, |
| RL6603,RL6604 | 25065517 or | NRL-2P5A-DC24-098 or |
| | 25065586 | NRL-2P5A-DC24-142 |
| | **Sockets** | |
| JL6803B | 25050269 | NSCT-5P97 |
| JL6804B | 25050269 | NSCT-5P97 |
| JL6805B | 25050268 | NSCT-4P96 |

**POWER AMPLIFIER PC BOARD (NAAF-7417-2A)**

| CIRCUIT NO. | PART NO. | | DESCRIPTION |
|---|---|---|---|
| | **Transistors** | | |
| Q6010~Q6014 | 2213284 or | * | 2SC1740S-R or |
| Q6020~Q6024 | 2213285 | * | 2SC1740S-S |
| Q6030~Q6034 | 2203434 or | | KTD2061-Y or |
| | 2203010 | | 2SC5171 |
| Q6040~Q6044 | 2203424 or | | KTB1369-Y or |
| | 2203000 | | 2SA1930 |
| Q6050~Q6054 | 2203563, | * | KTC5242-O, |
| | 2202842, | * | 2SC5242-R, |
| | 2202843, | * | 2SC5242-O, |
| | 2203562, | * | KTC5242-R, |
| | 2203663, | * | MN130S-O, |
| | 2203664 or | * | MN130S-Y or |
| | 2203666 | * | MN130S-P |
| Q6060~Q6066 | 2203553, | * | KTA1962-O, |
| | 2202832, | * | 2SA1962-R, |
| | 2202833, | * | 2SA1962-O, |
| | 2203552, | * | KTA1962-R, |
| | 2203673, | * | MP130S-O, |
| | 2203674 or | * | MP130S-Y or |
| | 2203676 | * | MP130S-P |
| Q6070~Q6074 | 2214984 or | | 2SC2631-R or |
| | 2214985 | | 2SC2631-S |
| Q6303 | 2215995, | | KTA1267-GR, |
| | 2213354 or | | 2SA933S-R or |
| | 2213355 | | 2SA933S-S |
| Q6701,Q6702 | 2215896, | | KTC3200-BL, |
| | 2210755, | | 2SC1775A-E, |
| | 2210756, | | 2SC1775A-F, |
| | 2211732, | | 2SC1845-F, |
| | 2211733 or | | 2SC1845-E or |
| | 2215895 | | KTC3200-GR |

CAUTION: Replacement for transistor of mark *, if necessary must be made from the same beta group ($h_{FE}$) as the original type.

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Transistors** | |
| Q6703 | 2215885, | KTA1268-GR, |
| | 2215886, | KTA1268-BL, |
| | 2211792 or | 2SA992-F or |
| | 2211793 | 2SA992-E |
| Q6601~Q6603 | 2215864, | KTC3199-GR, |
| Q6901 | 2212115, | 2SC2458-GR, |
| | 2213284 or | 2SC1740S-R or |
| | 2213285 | 2SC1740S-S |
| | **Diodes** | |
| D6000~D6004 | 223163, | 1SS133, |
| D6306,D6307 | 223205 or | 1SS270A or |
| D6701,D6702 | 223222 | WG713A |
| D6703,D6704 | 224470512 | MTZJ5.1B |
| D6903,D6904 | 22380130, | D5SBA20, |
| | 22380038 or | RBV602 or |
| | 22380274 | RS603M |
| D6906 | 223163, | 1SS133, |
| | 223205 or | 1SS270A or |
| | 223222 | WG713A |
| | **Capacitors** | |
| C6040~C6044 | 394684707 | 47uF,50V,Elect. |
| C6230~C6234 | 374724734 | 0.047uF+/-5%,50V,Plastic |
| C6701,C6706 | 394621017 | 100uF,6.3V,Elect. |
| C6704 | 394680107 | 1uF,50V,Elect. |
| C6901,C6902 | 3504384 | 10000uF,71V,Elect. |
| C6903 | 374721044 | 0.1uF+/-5%,50V,Plastic |
| C6904C6905 | 374723344 | 0.33uF+/-5%,50V,Plastic |
| C6906,C6907 | 374721044 | 0.1uF+/-5%,50V,Plastic |
| | **Resistors** | |
| R6040~R6044 | 5210258 | N06HR1KBC,Trimming |
| R6070~R6074 | 415471114 | 110ohm+/-5%,1/4W,NF carbon |
| R6080~R6084 | 415470224 | 2.2ohm+/-5%,1/4W,NF carbon |
| R6090~R6094 | 415470224 | 2.2ohm+/-5%,1/4W,NF carbon |
| R6100~R6104 | 4800071, | RSS2WK-0.22, |
| | 4000131 or | RGC22-0.22 OHMK or |
| | 4500027, | MPC708-2WK-0.22, Metal plate |
| R6230~R6234 | 453630824 | 8.2ohm+/-5%,1W,Metal |
| R6850,R6851 | 443523914 | 390ohm+/-5%,1/2W,Metal oxide |
| | **Fuses** | |
| F6901, | 252198 or | ⚠ 8A-UL or |
| F6902 | 252261 | ⚠ 8A-T/UL-ST2,Fuse |
| | **Fuse holders** | |
| F6901A,F6901B | 25052133 | ⚠ NSCT-1P2031 |
| F6902A,F6902B | 25052133 | ⚠ NSCT-1P2031 |
| | **Relays** | |
| RL6901 | 25065561, | NRL-1P5A-DC12-127, |
| RL6902 | 25065508, | NRL-1P10A-DC12-093, |
| | 25065515 or | NRL-1P5A-DC12-096 or |
| | 25065526 | NRL-1P5A-DC12-102 |
| | **Sockets** | |
| JL6402A | 25051087 | NSCT-3P874 |
| JL6803A | 25051109 | NSCT-5P896 |
| JL6804A | 25051109 | NSCT-5P896 |
| JL6805A | 25051108 | NSCT-4P895 |
| JL6951A | 25051109 | NSCT-5P896 |
| JL6952A | 25051109 | NSCT-5P896 |
| | **Plugs** | |
| P6000~P6004 | 25056010 | NPLG-5P0960 |
| P6011 | 25056014 | NPLG-9P0964 |
| P6080~P6084 | 25055038 | NPLG-2P29 |
| P6301 | 25055038 | NPLG-2P29 |
| P6931 | 25055711 | NPLG-15P667 |
| P931 | 25055701 | NPLG-5P657 |
| | **Radiator** | |
| D6903A | 27160499 | RAD-164 |

# PRINTED CIRCUIT BOARD-PARTS LIST 4

**PRIMARY CIRCUIT PC BOARD (NAPS-7420-2A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Transistors** | |
| Q921 | 2215864, | KTC3199-GR, |
| | 2212115, | 2SC2458-GR, |
| | 2213284 or | 2SC1740S-R or |
| | 2213285 | 2SC1740S-S |
| | **Diodes** | |
| D921~D924 | 22380260 or | RL1N4003 or |
| | 22380035 | GP104003E |
| D925 | 223163, | 1SS133, |
| | 223205 or | 1SS270A or |
| | 223222 | WG713A |
| | **Power transformer** | |
| T902 | 2301381 | ⚠ NPT-1358D |
| | **Capacitors** | |
| C901 | 3500196 | ⚠ RE275V-103M,IS |
| C922 | 394662217 | 220uF,35V,Elect. |
| | **Resistors** | |
| R901 | 4000206 or | ⚠ RD1/2SPH-3.3M or |
| | 431533355 | ⚠ RC1/2GFKUL-3.3M,Solid |
| R924 | 443528204T | 82ohm+/-5%,1/2W,Metal oxide |
| | **Fuse** | |
| F901 | 252198 or | ⚠ 8A-UL or |
| | 252261 | ⚠ 8A-T/UL-ST2,Fuse |
| | **Fuse holders** | |
| F901A,F901B | 25052133 | ⚠ NSCT-1P2031 |
| | **AC outlet** | |
| P902 | 25051571 | ⚠ NSCT-2P1358 |
| | **Relay** | |
| RL901 | 25065561, | ⚠ NRL-1P5A-DC12-127, |
| | 25065508, | ⚠ NRL-1P10A-DC12-093, |
| | 25065515 or | ⚠ NRL-1P5A-DC12-096 or |
| | 25065526 | ⚠ NRL-1P5A-DC12-102 |
| | **Socket** | |
| P931A | 25051230 | NSCT-5P1020 |
| | **Plug** | |
| P901A | 25055675 or | ⚠ NPLG-2P631 or |
| | 25056028 | ⚠ NPLG-2P0978 |
| | **Label** | |
| F901C | 29360842 | Fuse |

**TERMINAL PC BOARD (NAETC-7421-2A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| JL6951B | 25051109 | NSCT-5P896,Terminal |
| JL6952B | 25051109 | NSCT-5P896,Terminal |

**VIDEO TERMINAL PC BOARD (NAVD-7422-2A)**

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **ICs** | |
| Q203 | 22241759 | LA7956 |
| Q212,Q213 | 22241759 | LA7956 |
| Q281 | 222740046R2 | 74HCU04F |
| | **Transistors** | |
| Q201,Q202 | 2213631 or | RN1241-A or |
| Q207,Q208 | 2213632 | RN1241-B |
| Q204,Q209 | 2215995 or | KTA1267-GR or |
| | 2213354 | 2SA933S-R |
| Q205,Q206 | 2215770 or | KRA102M or |
| | 2213510 | DTA114ES |
| Q210,Q211 | 2213631 or | RN1241-A or |
| | 2213632 | RN1241-B |
| | **Photo couplers** | |
| U281,U282 | 24120083, | GP1FA550RZ, |
| | 24120086 or | GP1FA551RZ or |
| | 24120095 | TORX179 |

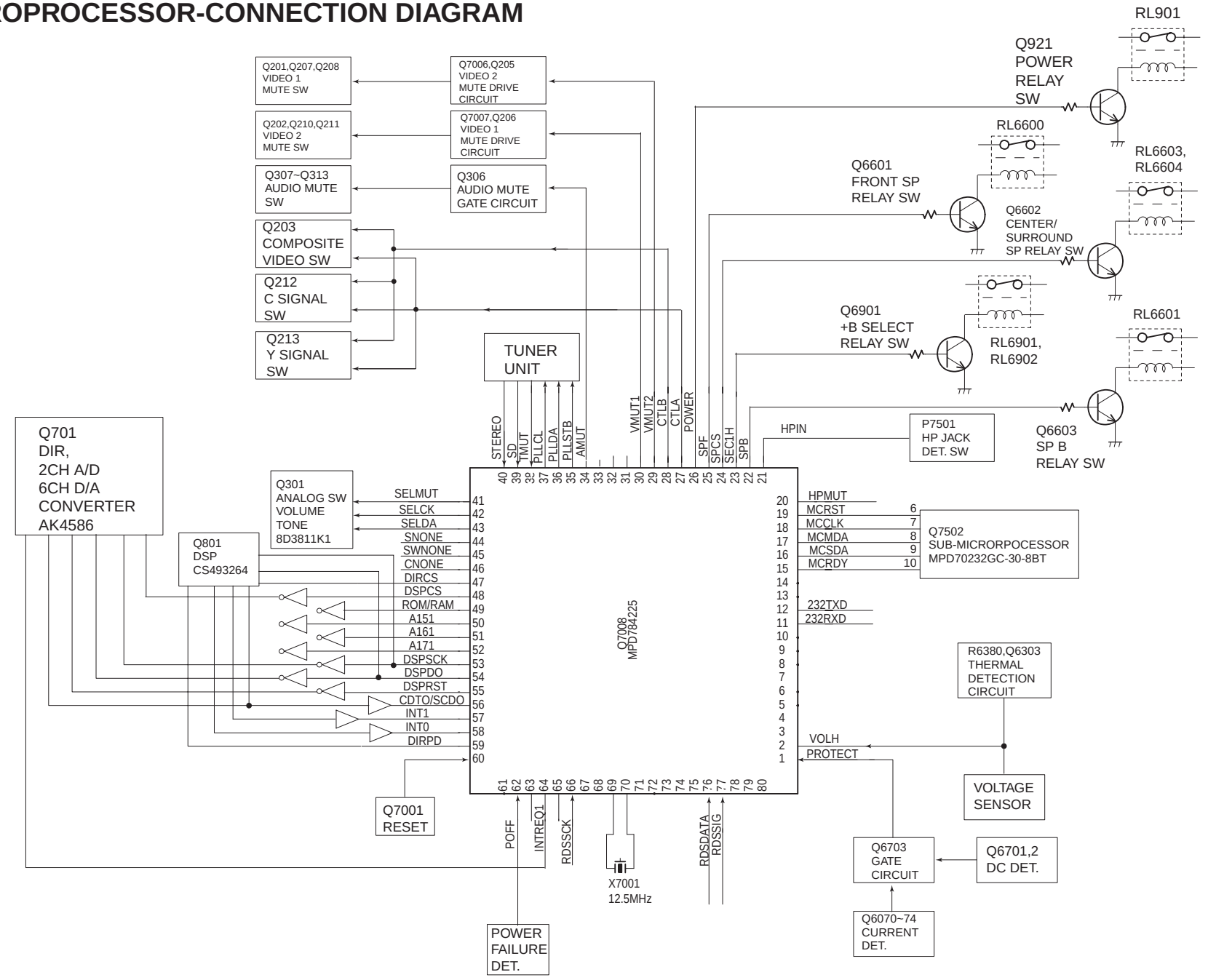
| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Coils** | |
| L281,L282 | 233454K220 | NCH-1452 220K |
| L283 | 233454M022 | NCH-1452 022M |
| | **Capacitors** | |
| C201,C202 | 394680227 | 2.2uF,50V,Elect. |
| C203,C205 | 394641017 | 100uF,16V,Elect. |
| C204,C207 | 394680227 | 2.2uF,50V,Elect. |
| C209,C213 | 394680227 | 2.2uF,50V,Elect. |
| C211,C215 | 394641017 | 100uF,16V,Elect. |
| C217,C218 | 394680227 | 2.2uF,50V,Elect. |
| C221,C223 | 394644707 | 47uF,16V,Elect. |
| C225 | 394644707 | 47uF,16V,Elect. |
| C285,C288 | 394624707 | 47uF,6.3V,Elect. |
| | **Terminals** | |
| P201,P202 | 25045681 | NPJ-10PDBY478 |
| P203 | 25045682 | NPJ-5PDBY479 |
| P281 | 25045473 | NPJ-1PDBL291 |
| P282 | 25045504 | NPJ-1PDBL319 |
| | **Socket** | |
| P206B | 25051239 | NSCT-14P1029 |
| | **Plug** | |
| P253A | 25055236 | NPLG-5P220 |

**THERMAL DETECTOR PC BOARD (NAETC-7424-2A)**

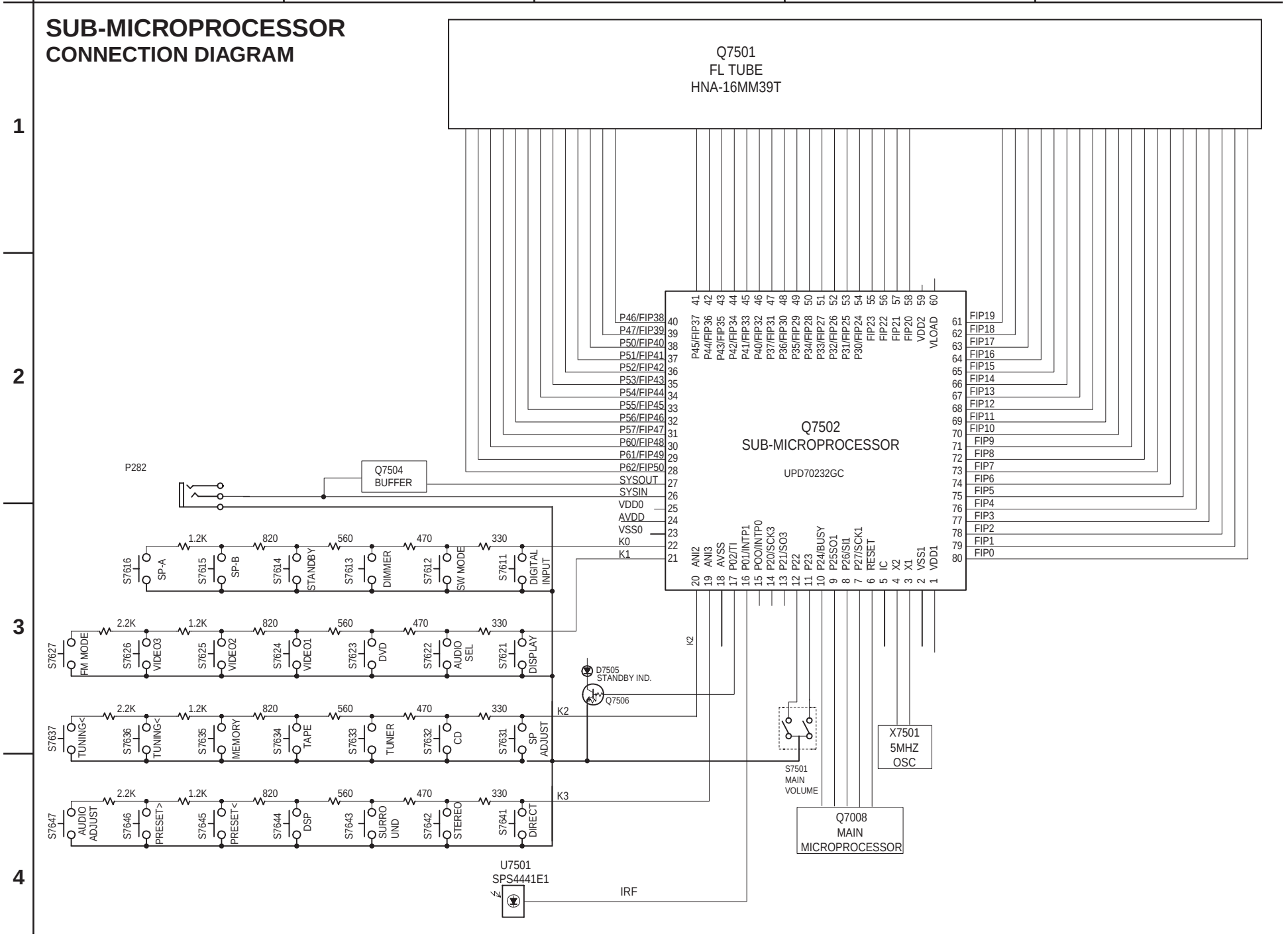
| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Thermistor** | |
| R6380 | 4000152 | PTH9M04BE222TS2F333 |
| | **Socket** | |
| JL6402B | 25051087 | NSCT-3P874 |

**NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.**

# MAIN MICROPROCESSOR-CONNECTION DIAGRAM



# SUB-MICROPROCESSOR
## CONNECTION DIAGRAM

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# TERMINAL DESCRIPTION

## MAIN MICROPROCESSOR

| No. | Terminal | I/O | Description |
|---|---|---|---|
| 1 | PROTECT | I | Protection circuit detection input terminal |
| 2 | VOLH | I | Power amplifier voltage detection terminal. |
| 3 | BAND | I | Region setting input terminal. |
| 11 | 232TXD | | Not used. |
| 12 | 232RXD | | Not used. |
| 15 | MCRDY | I | Data ready detection input terminal from the sub microprocessor. |
| 16 | MCSDa | I | Data input terminal from the sub microprocessor. |
| 17 | MCMDA | O | Data output terminal to the sub microprocessor. |
| 18 | MCCLK | O | Serial clock output terminal to the sub microprocessor |
| 19 | ~MCRST | O | Reset signal output terminal to the sub microprocessor |
| 20 | HPMUT | O | Muting control output terminal for headphone amplifier. |
| 21 | HPIN | I | Input terminal to detect the connection of headphone |
| 22 | SPBRL | O | Speaker B relay control output terminal. |
| 23 | SEC1H | O | Voltage +/-B control output terminal. |
| 24 | SPACSRL | O | Speaker relay control output terminal for center and surround channels |
| 25 | SPAFRL | O | Speaker relay A control output terminal for front channels |
| 26 | POWERRL | O | Power source relay control output terminal |
| 27 | VCTRLA | O | Control signal A output terminal for the video selector switch |
| 28 | VCTRLB | O | Control signal B output terminal for the video selector switch |
| 29 | VMUT2 | O | Muting control output terminal for the video section 2 |
| 30 | VMUT1 | O | Muting control output terminal for the video section 1 |
| 34 | AMUT | O | Audio muting control output terminal |
| 35 | PLLSTB | O | Strobe signal output terminal to PLL IC |
| 36 | PLLSDO | O | Serial data output terminal to PLL IC |
| 37 | PLLCLK | O | Serial clock output terminal to PLL IC |
| 38 | TUMUT | O | Muting control output terminal for the tuner section |
| 39 | ~SD | I | Broadcast detection input terminal more than a muting level. |
| 40 | ~STEREO | I | FM stereo broadcast detection input terminal |
| 41 | SELMUT | O | Muting control output terminal for selector, volume and tone IC BD3811. |
| 42 | SELCLK | O | Serial clock output terminal of IC BD3811. |
| 43 | SELSDO | O | Serial data and latch signal output terminal for IC BD3811 |
| 44 | SNONE | O | Not used. |
| 45 | SWNONE | O | Not used. |
| 46 | CNONE | O | Not used. |
| 47 | ~DIRCS | O | Chip select signal output terminal to DIR IC AK4586 |
| 48 | ~DSPCS | O | Chip select signal output terminal to DSP IC. |
| 49 | ~ROM/RAM | O | ROM/RAM select terminal. Not used. |
| 50 | ADDR151 | O | DSP boot ROM address 15 select terminal. Not used. |
| 51 | ADDR161 | O | DSP boot ROM address 16 select terminal.Not used. |
| 52 | ADDR171 | O | DSP boot ROM address 17 select terminal.Not used. |
| 53 | DSPCLK | O | Serial clock output terminal for DIR and DSP ICs. |
| 54 | DSPSDO | O | Serial data output terminal for DIR and DSP ICs. |
| 55 | ~DSPRST | O | Reset signal output terminal to DSP IC. |
| 56 | CDTO/SCDO | I | Serial data input terminal from DIR and DSP ICs. |
| 57 | INT1 | I | Input terminal to detect the status of DIR IC. |
| 58 | INT0 | I | Input terminal to detect the unlock of DIR IC. |
| 59 | ~DIRPD | O | Power down terminal to DIR and CODEC ICs. |
| 60 | RESET | I | Reset input terminal |
| 62 | POFF | I | Power failure detection input terminal |
| 64 | ~INTREQ/~ABOOT | I/O | Interrupter input terminal from DSP IC. |
| 66 | ~RDSCLK | I | RDS clock input terminal.Not used. |
| 69 | X2 | | Connect the ceramic oscillator 12.5MHz. |
| 70 | X1 | | Connect the ceramic oscillator 12.5MHz. |
| 71 | TEST/VPP | | Test terminal. |
| 72 | XT2 | | Not used. |
| 73 | XT1 | | Not used. |
| 76 | RDSDATA | I | Data input terminal of RDS broadcast. Not used. |
| 77 | RDSSIG | I | Input terminal to check the signal of RDS broadcast. Not used. |

# TERMINAL DESCRIPTION

## SUB MICROPROCESSOR

| Pin No. | Symbol | I/O | Description | Pin No. | Symbol | I/O | Description |
|---|---|---|---|---|---|---|---|
| 1 | VDD | | Power supply terminal. Connect to 5V. | 41 | P22 | O | Segment output terminal of P22. |
| 2 | VSS | | Ground terminal. | 42 | P21 | O | Segment output terminal of P21. |
| 3 | X1 | | Ceramic oscillator connection terminals for main system. | 43 | P20 | O | Segment output terminal of P20. |
| 4 | X2 | | Connect the 5MHz ceramic oscillator between #3 and #4. | 44 | P19 | O | Segment output terminal of P19. |
| 5 | IC/VPP | | Internal connection terminal | 45 | P18 | O | Segment output terminal of P18. |
| 6 | ~RESET | I | System reset signal input terminal. | 46 | P17 | O | Segment output terminal of P17. |
| 7 | SUBCL/SCK | I | Clock input terminal to transmit the signal from main microprocessor. | 47 | P16 | O | Segment output terminal of P16. |
| 8 | SUBDO/SDI | I | Data input terminal to transmit the signal from main microprocessor. | 48 | P15 | O | Segment output terminal of P15. |
| 9 | SUBDI/SDD | O | Data output terminal to transmit the signal to main microprocessor. | 49 | P14 | O | Segment output terminal of P14. |
| 10 | SUBLDY | O | Data ready output terminal to transmit to the main microprocessor. | 50 | P13 | O | Segment output terminal of P13. |
| 11 | VBJ | I | Pulse input terminal from the rotary encoder of volume. | 51 | P12 | O | Segment output terminal of P12. |
| 12 | VAJ | I | Pulse input terminal from the rotary encoder of volume. | 52 | P11 | O | Segment output terminal of P11. |
| 13 | SSCBJ | I | Not used. | 53 | P10 | O | Segment output terminal of P10. |
| 14 | SSCAJ | I | Not used. | 54 | P9 | O | Segment output terminal of P9. |
| 15 | ~IRIN | I | Not used. | 55 | P8 | O | Segment output terminal of P8. |
| 16 | ~IRF | I | Signal input terminal from the remote controller. | 56 | P7 | O | Segment output terminal of P7. |
| 17 | STBYLED | O | Standby LED control output terminal. | 57 | P6 | O | Segment output terminal of P6. |
| 18 | AVSS | | Ground terminal for A/D converter. | 58 | P5 | O | Segment output terminal of P5. |
| 19 | K3 | I | Operation key connection terminal. | 59 | VDD2 | | Power supply terminal. Apply +5V. |
| 20 | K2 | I | Operation key connection terminal. | 60 | VLOAD | | Negative power supply terminal of FL controller. |
| 21 | K1 | I | Operation key connection terminal. | 61 | P4 | O | Segment output terminal of P4. |
| 22 | K0 | I | Operation key connection terminal. | 62 | P3 | O | Segment output terminal of P3. |
| 23 | VSS0 | | Ground terminal | 63 | P2 | O | Segment output terminal of P2. |
| 24 | AVDD | | Power supply terminal for A/D converter. | 64 | P1 | O | Segment output terminal of P1. |
| 25 | VDDD | | Power supply terminal. Apply +5V. | 65 | 16G | O | Grid output terminal of 16G. |
| 26 | ~SYSIN | I | System code input terminal. | 66 | 15G | O | Grid output terminal of 15G. |
| 27 | ~SYSOUT | O | System code output terminal. | 67 | 14G | O | Grid output terminal of 14G. |
| 28 | P35 | O | Segment output terminal of P35. | 68 | 13G | O | Grid output terminal of 13G. |
| 29 | P34 | O | Segment output terminal of P34. | 69 | 12G | O | Grid output terminal of 12G. |
| 30 | P33 | O | Segment output terminal of P33. | 70 | 11G | O | Grid output terminal of 11G. |
| 31 | P32 | O | Segment output terminal of P32. | 71 | 10G | O | Grid output terminal of 10G. |
| 32 | P31 | O | Segment output terminal of P31. | 72 | 9G | O | Grid output terminal of 9G. |
| 33 | P30 | O | Segment output terminal of P30. | 73 | 8G | O | Grid output terminal of 8G. |
| 34 | P29 | O | Segment output terminal of P29. | 74 | 7G | O | Grid output terminal of 7G. |
| 35 | P28 | O | Segment output terminal of P28. | 75 | 6G | O | Grid output terminal of 6G. |
| 36 | P27 | O | Segment output terminal of P27. | 76 | 5G | O | Grid output terminal of 5G. |
| 37 | P26 | O | Segment output terminal of P26. | 77 | 4G | O | Grid output terminal of 4G. |
| 38 | P25 | O | Segment output terminal of P25. | 78 | 3G | O | Grid output terminal of 3G. |
| 39 | P24 | O | Segment output terminal of P24. | 79 | 2G | O | Grid output terminal of 2G. |
| 40 | P23 | O | Segment output terminal of P23. | 80 | 1G | O | Grid output terminal of 1G. |

HT-R500

# ADJUSTMENT AND CONFIRMATION PROCEDURES 1

**Idling current adjustment**

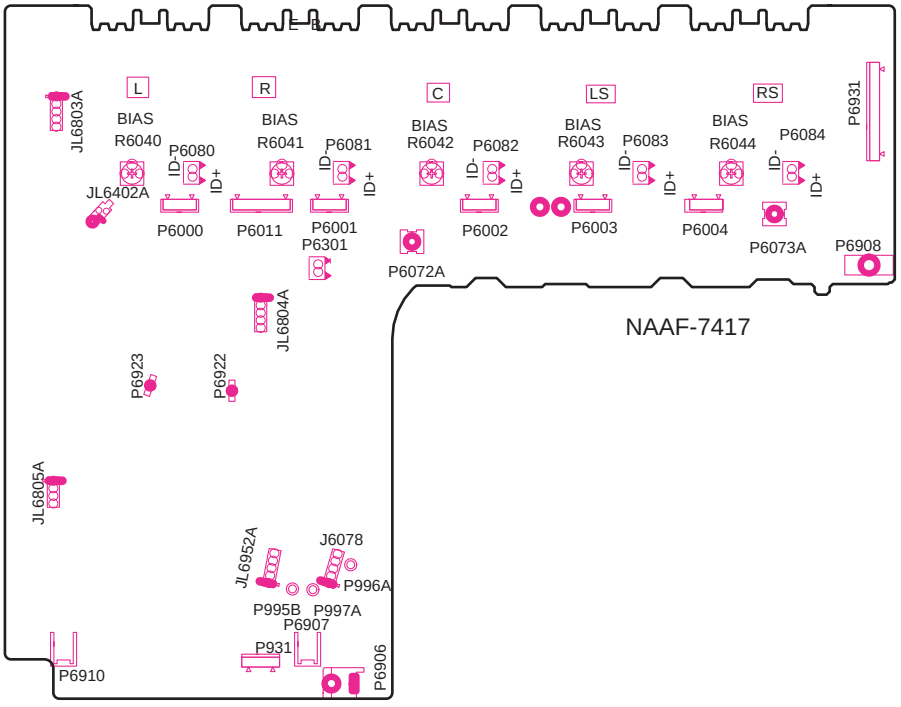
Before Idling adjustment, turn the trimming resistors R6040,R6041,R6042,R6043 and R6044 to counter clockwise.
Connect the DC voltmeter to sockets P6080,P6081,P6082,P6083 and P6084.
After turn POWER to ON, adjust the trimming resistors R6040 and R6041 so that the reading of voltmeter becomes 2.5 mV. (Front channels)
Adjust the trimming resistors R6042, R6043 and R6044 so that the reading of voltmeter becomes 1.5 mV. (Center and surround channels)
After adjustment, attach the top cover.
Confirm the voltage of points above after about five minutes.

**Front and center channels**

When less than 7.0 mV, readjust the resistors above so that the voltage becomes 7.0 mV.
When 7.0 mV to 9.0 mV, you are not necessary to adjust.
When more than 9.0 mV, readjust the resistors above so that the voltage becomes 9.0 mV.

**Surround channels**

When less than 4.0 mV, readjust the resistors above so that the voltage becomes 4.0 mV.
When 4.0 mV to 6.0 mV, you are not necessary to adjust.
When more than 6.0 mV, readjust the resistors above so that the voltage becomes 6.0 mV.
Note: No load and No signal




**Confirmation of protection circuit**

**1. Confirmation of operation of speaker relay**

Confirm that the speaker relays turn ON approximate. 5 seconds after the power switch is turned ON.
Confirm that the speaker relays turn OFF immediately after the power switch is turned OFF.

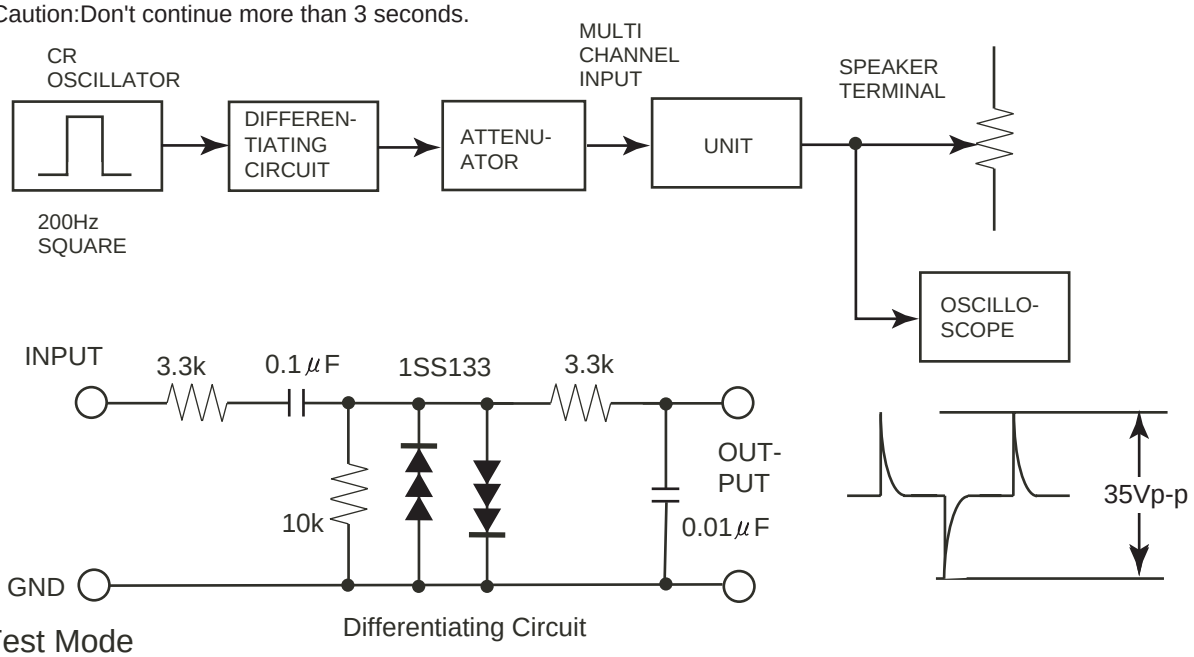
**2. Confirmation of DC detection circuit**

Press and hold down CD button, then press STANDBY/ON and DISPLAY buttons to set the unit to "TEST-1" mode.
After "TEST-1" on the FL tube light on, press VIDEO 1 button to set the unit to "TEST-1-00".
Apply DC 1.5 to 3V to DVD INPUT terminal with no load.
Confirm that the speaker relay turns OFF.
Apply DC -1.5 to -3V to DVD INPUT terminal with no load.
Confirm that the speaker relay turns OFF.
Caution: Don't apply DC voltage more than 1 sec..

# ADJUSTMENT AND CONFIRMATION PROCEDURES 2

**3. Confirmation of Current detection circuit**

Set the unit to "TEST-1-00".
Connect the differentiating circuit and apply the 200Hz square signal to MULTI CHANNEL INPUT terminal of each channel.
Adjust the attenuator or Volume so that the output level becomes 35V p-p.
Confirm that the speaker relay does not turn OFF when a 3.0 ohm load is connected.
Confirm that "Protect" indicator lights on when a 1.5 ohm load is connected.
Caution:Don't continue more than 3 seconds.



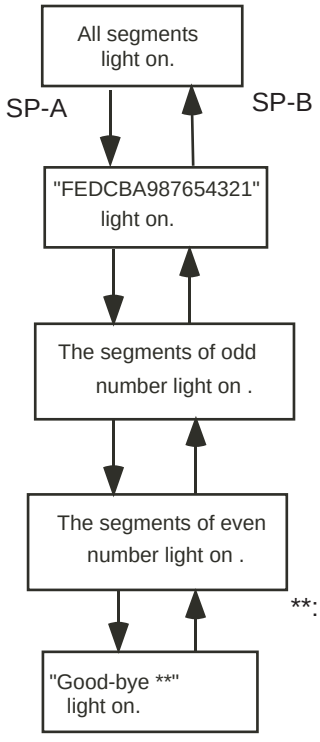

Differentiating Circuit

## Test Mode

1. Turn POWER button on.
2. Press and hold down CD button, then press STANDBY/ON button.
3. After "TEST-" on the FL tube is displayed, press CD button to set the unit to the test mode of FL tube.

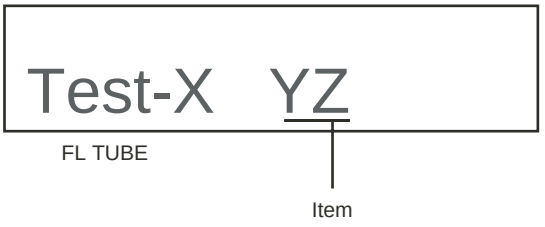
Note: DVD:TEST-1 VIDEO 1 :TEST-2 SP-A: UP
VIDEO 2 :TEST-3 VIDEO 3:TEST-4 SP-B: DOWN

Test mode of FL tube




**: Region US:U.S.A.
EU:Europe
WR:Other models

Press POWER button
to finish the test mode of FL tube.




**Confirmation of voltage sensor**

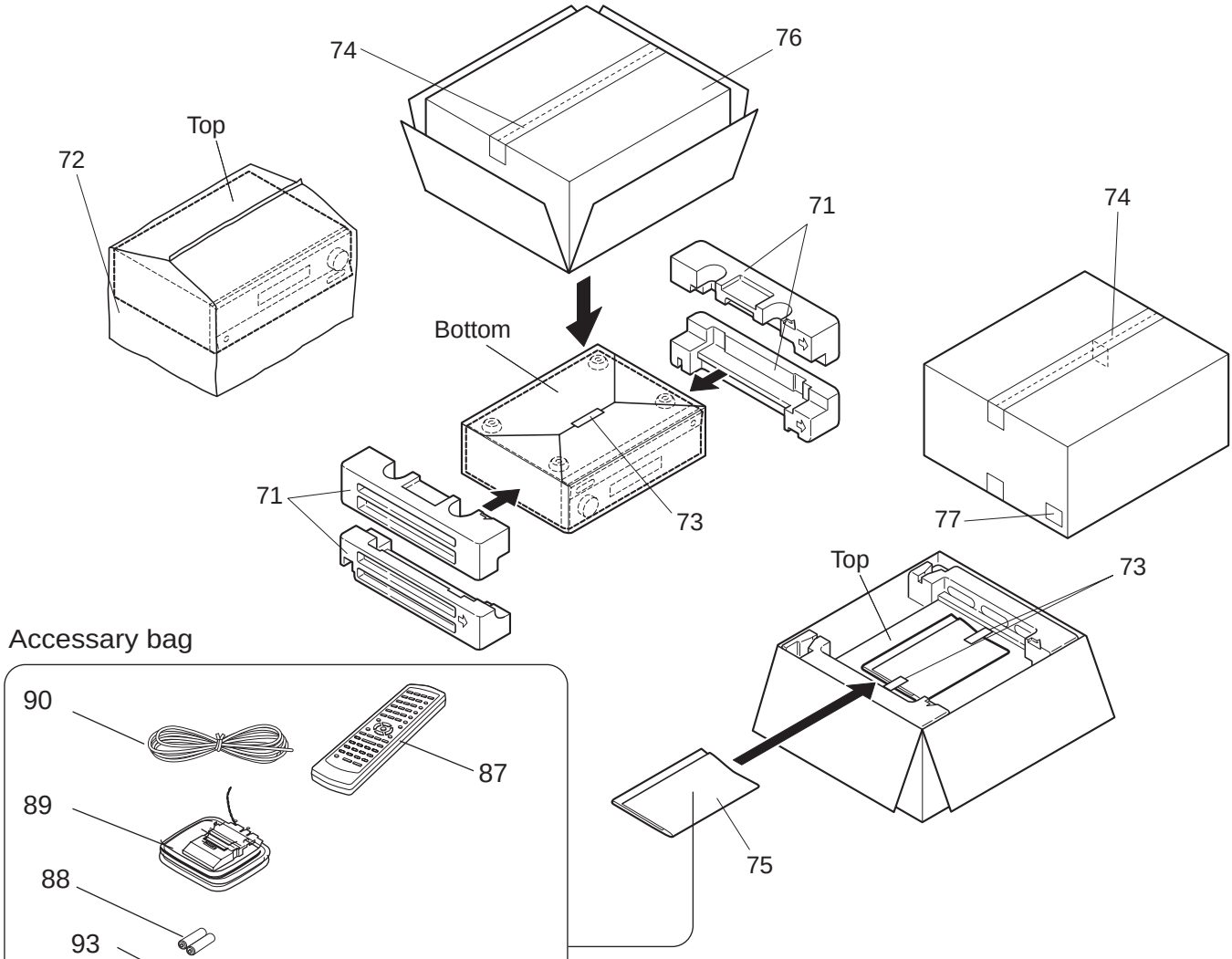
1. Set the unit to TEST-3-2.
2. Apply the signal 1kHz, -15dBV to the MULTI-CH input. Confirm that the FM STEREO is displayed. Confirm the all channels except SUBWOFFER.
3. When connect the resistor 2.7 kohm/1 W between the terminals COM and TH1 of P6301, confirm that "FM STEREO" light on.

Note: No input signal.

4.When set the unit to "TEST-4-30,confirm that the speaker relays of RL6901 and RL6902 turn off.

Note: No input signal.

# PACKING PROCEDURES




Put the label 81 between page 2 and page 3 of instruction manual E.

| REF.NO. | PART NO. | DESCRIPTION |
|---|---|---|
| 71 | 29092044 | Pad |
| 72 | 29100034-1A | 850*650,Poly bag |
| 73 | 29110149 | Tape, cellophane |
| 74 | 29110148 | PP tape |
| 75 | 29100201 | 350*200*W250,Polybag |
| 76 | 29053904B | Carton box |
| 77 | 29363120 | Label UPC |
| 81 | 29363059A | Label,cable |
| 83 | 29343336A | Instruction manual E |
| 86 | 29343337 | Instruction manual,digest |
| 87 | 24140478 | RC-478M,Remote controller (Before change) |
| | 24140518 | RC-518M,Remote controller (After change) |
| | 29355407 | Instruction sheet for RC-518M |
| 88 | 3010054 | UM-3,Two batteries |
| 89 | 232140 | NMA-3057,AM loop antenna |
| 90 | 292142 | FM antenna |
| 93 | 29365090A | Warranty card |

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